

Sportsman Pilot™



Fall



1984



Sportsman Pilot



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ALL ARTICLES AND PICTURES BY JACK COX UNLESS OTHERWISE CREDITED.

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MAG CHECK

"Eternal vigilance is the price of our freedom to fly" . . . to paraphrase a famous admonition from our grade school history books. Recently, during the maneuvering by the FAA and the airlines to realign arrival and departure slots at major airports, we again heard calls for banning general aviation at places where the big boys park. Picked up by the print and electronic media, we once more had to endure the repeated inferences that the situation involved lightplanes versus the "public interest" . . . as if private owners of aircraft are something other than the "public" and that stockholder owned, for profit airlines are somehow public utilities. Fortunately, after the airlines found they **could** survive if they arrived at O'Hare or Washington National at five minutes before or after rather than right on the hour, the whole thing blew over, leaving our access to all airports intact.

This latest episode serves, nevertheless, to remind us of the need for togetherness in our flying fraternity. Even the news reports at the time mentioned that "pilot groups" would surely oppose the proposed bans . . . and you can bet they did. In this instance, in fact, simply the **threat** of pilot group opposition was enough to keep the wolves at bay. It takes large group action to do this, so it certainly is to our benefit to belong to and support one or more of the pilot organizations. Quite naturally, with my personal affiliation, I would encourage each of you to join the Experimental Aircraft Association if you're not already a member, but no matter what your preference, join and support something.

To lapse into paraphrase once more, the freedom you save **will** be your own. ♡

KALEIDOSCOPE



The Predator Model 480.

GIFT SUBSCRIPTIONS

Last year a lot of you took us up on our offer to help with your Christmas shopping, so we're gonna do it again. Buy a friend a subscription to SPORTSMAN PILOT and we'll send him or her a nice Christmas card with a note inside extolling your virtues as a true aviation friend. We'll start 'em with this issue or the Winter (February) issue - your choice. There's no extra charge for this service and there's no limit on the number of gift subscriptions you can buy - just remember to include each recipient's full mailing address.

Ol' Santa will love you for it - it'll help keep his sleigh under gross!

RUTAN'S LATEST

Burt Rutan says he is getting on a schedule that will see two completely new designs flown **per year**. He's already made his quota for 1984 with the Voyager and the Predator Model 480, an ag plane designed for Advanced Technology Aircraft Company of Hanford, CA. Pictured here, the Predator is a big beast, with a 58.5 ft. main wing span, an 80 cubic foot hopper and a payload of over 3200 pounds. The all composite airframe is currently powered by a 400 hp Lycoming, but expect a turboprop shortly. Ag planes are a little out of our line at SPORTSMAN PILOT, but take a look at the very unusual canard/wing configuration of the Predator. The creation of Burt and airfoil

wizard, John Roncz, there were things learned in its development that will show up on a homebuilt in the not too distant future.

VOYAGER UPDATE

Dick Rutan and Jeana Yeager have now flown the Voyager with sufficient fuel to break all the existing world distance records. All the aircraft's 15 fuel tanks had some fuel in them so that the transfer pumps could be tested. No problems were encountered, so the plan is to fly up and down the Pacific Coast this fall to break the world's closed course record, then fly from Puerto Rico to Australia to take the straight line distance away from the Air Force (B-52). If all goes well, these flights, at least the closed course attempt, should be made before year's end.

Good luck to both of you.

ANTIQUE PIONEERS

It was great to see a couple of the pioneers of the antique airplane hobby world at Oshkosh this past summer. Andy Anderson and Shelby Hagberg are frequently recognized on these pages for their roles in helping get preservation and restoration activity going back there in the 1940s and early 50s. Shelby was at Oshkosh proudly squiring one of the antique treasures he's been saving for lo' these many years - an OX-5 powered American Eagle. He sold shares to a couple of eager young craftsmen, Howard Fassler and Barry Johnson, who restored it to prize

winning condition and flew it to Wisconsin for display.

Andy Anderson was keeping a low profile - because he was on an intelligence gathering mission. He and a friend, you see, are going into the business of building ultralight replicas of vintage airplanes.

Keep at it, both of you!

COMPOSITE FUTURE

Think the aviation world isn't rushing headlong toward composite construction? Forget it - NASA and Lockheed will spend \$26 million over the next five years developing a **center section** for a C-130 completely of composites. Spanning 37 feet and weighing 5,000 pounds, it will be the largest composite **primary** structure built to date, according to Lockheed. The center section is the backbone of most airplanes . . . can a 100% composite C-130 be far behind?

Remember, you saw it first in homebuilts.

BLOWERS FROM BEACHNER

Chris Beachner has spent this past summer flying all over the U. S. in his V-8 Special fitted with a Roots-type supercharger. Altogether, he's logged over 100 hours behind the blower with nary a glitch to date, so now he's ready to put them on the market for other homebuilders. He has become a factory distributor and will provide you with price information and performance specs for the asking. Just send a self addressed, stamped envelope to Chris Beachner, P. O. Box 971,

Eloy, AZ 85231-0971 and ask for the blower info.

The little belt driven blower Chris is using is made in Southern California and was recently ordered in volume by GM for use on a pickup. That's great news because with that kind of volume, the price is more likely to stay in a reasonable range. Chris is convinced the supercharger will eventually replace the turbocharger in light aircraft.

BRADFORD VILLAGE

Remember Wings and Wheels Museum - the **original** Wings and Wheels in Santee, SC? Well, owner Dolph Overton has turned the old runway, hangar and antique railroad site into a retirement community named Bradford Village. There is a 2,000 ft. grass strip on a golf course nearby, so if any of you are looking for a place to retire with golf, fishing and an airport nearby, write for a brochure. The address is Bradford Village, One Bradford Blvd., P. O. Box 70, Santee, SC 29142.

COMET UPDATE NO. 1,001

Finally! By the time you are reading this, Grosvenor House, the D.H.88 Comet that won the 1934 England to Australia air race should have been restored to airworthiness by the Royal Aircraft Establishment, been displayed at England's Farnborough air show and air freighted to Melbourne, Australia for the 50th anniversary celebrations of New South Wales. The plan is to re-enact the end of the legendary "world's longest air race" with various audio visual effects and old movie footage and, of course, the old racer itself as a static display. It will spend the winter (summer down there) in Australia before being air freighted back to the UK where it will be flight tested and eventually returned to the Shuttleworth Trust at Old Warden airfield.

THE GLOOM DEEPENS

Just how bad a year is the U. S. lightplane industry really having? Well, for starters, the General Aviation Manufacturers Association has revised its projection of 3,245 new aircraft for 1984 **down** to 2,300 and billings have dropped from a high of \$2.9 billion in 1981 to a low of \$1.4 billion last year. It may be even lower this year. In 1979, Wichita's big three, Cessna, Beech and Learjet, employed 25,700 workers. Today, they employ about 13,500 - and new layoffs are an everyday hazard.

About the only bright spot on the horizon is the persistent rumor that some of the companies are spending money to design a new generation of more efficient lightplanes . . . single engine airplanes, included. New engines are said to be under consideration, also, and the word is a Mooney is about to be fitted with the new ultra modern Porsche aircraft engine.

LYCOMING CUTS PRICES

If you are in the market for a new or factory remanufactured Lycoming engine, then AVCO Lycoming may be **your** Santa this year. The firm has reduced the published list prices on **all** its reciprocating engines - and on most of its parts, too. The factory remans,

for example, are reduced just over 15%.

The sad realities of today's lightplane market are responsible for the price roll backs, of course, but let's hear it anyway for a company willing to apply standard marketplace pricing practices to the aviation scene.

NEW PARTS FROM UNIVAIR

Univair has some goodies for you owners of Cessna 120, 140 and 170s. First, there's a new rudder bellcrank (P/N 003-U0433113) that's FAA-PMA approved and priced at \$75.00. Then there are blank aluminum instrument panel covers for the Cessna 140A and 170 series. The left hand panel is P/N

003-0412492, the right hand panel is P/N 003-0413113 and the top panel is P/N 003-0412489. Univair's address is 2500 Himalaya Rd., Aurora, CO 80011. Phone 303/364-7661.

USAF ULTRALIGHT

The U. S. Air Force wants to buy as many as three different ultralights for evaluation as covert communications relay platforms. Manufacturers should dash breathlessly to the nearest post office with their expressions of interest addressed to Code ESD/PKG, Hanscombe AFB, MA. ☐



The Height Of Ambition

Photo by Rafe Tomsett



Reno '84



Stilleto . . .

Another year, another exotic name, another brand new racer wins the Unlimited Gold at Reno. Before 1982 it had never happened before, a racer winning on its very first attempt. Now, however, for three consecutive years we've seen 'em roll out of the shop, onto the race course and into the winner's circle: Dago Red in '82, Dreadnought in '83 and, this year, the radically altered P-51D, the Stilleto.

Only the pilot was a veteran, Skip Holm of Woodland Hills, CA, who was also Unlimited Champion in 1981.

It didn't start out as Stilleto's year. In qualifying, last year's winner, Neil Anderson, blasted the mighty Dreadnought, a Pratt and Whitney R-4360 powered Hawker Sea Fury, around Reno's 9.187 mile Unlimited course at a speed of 442.569 mph, snatching the pole position from a surprisingly fast John Crocker by just .03 for a second! John had his venerable clipwing Mustang, "Somethin' Else", really wailing - clocking in at 442.569 mph. Ron Hevle was a close third at 440.976 mph in Strega, another highly modified Mus-

tang . . . and then there was a big gap in speed back to Skip Holm and Stilleto at 433.292 - almost 10 mph off the Dreadnought's place. The remaining serious contenders were Rick Brickert and Dago Red at 430.641 mph and Jimmy Leeward in his Leeward Air Ranch Special at 425.543 mph. All were considered capable of running in the 440 range, but those that didn't were having mechanical woes of one sort or another during qualifying . . . or else were suspected of holding back a little to save their engines for the money races.

The darkhorses were Bill Destefani and his P-51 "Mangia Pane" at 425.105 mph and Steve Hinton and his "Supercorsair" at 425.015 mph. If the hot dogs pushed each other beyond their engine's limits, Destefani or Hinton might sneak right on by to capture the Gold. It had happened before. Actually, Steve Hinton would show more than a darkhorse's speed before the week was over - but he started out in that role.

Realistically, however, by the end of qualifying on Wednesday, it looked like we were going to see a rerun of last year's races, with

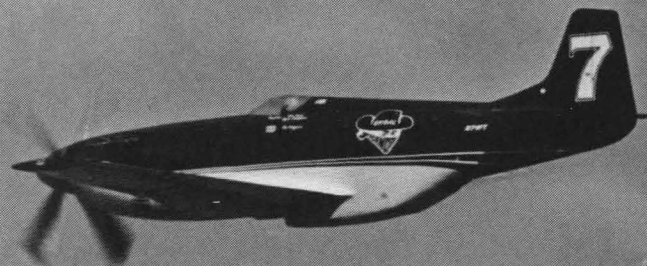
Neil Anderson and the Dreadnought running everyone else into the ground. Sure, the Mustangs were probably as fast, but could they last 8 laps at over 100 inches of manifold pressure?

The Unlimited field at Reno is limited to the 27 fastest qualifiers. The top six got a bye on Thursday, with the remaining 21 battling it out in three heat races of 7 planes each. Heat 1A consists of the 7 fastest of the 21, Heat 1B the next 7 fastest and Heat 1C the 7 slowest. The winners of the three heats move up to the next fastest group on Friday. This system of progression by order of finish goes on until Sunday, the final day of racing, when 3 races of 9 planes each vie for Bronze, Silver and Gold trophies, the relative values of the metals signifying the speeds of the groups. The winner of the Gold race is considered the national champion for the year, since no other Unlimited race is currently held in the United States.

31 Unlimited racers qualified for the 1984 Reno Air Races and all but the slowest, Wiley Sanders' B-25 . . . yes, a B-25 with a speed of 242.543 mph . . . ultimately got into

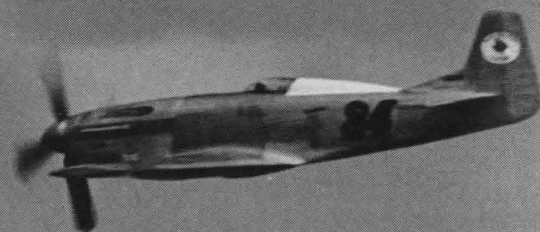


Stilleto's wings are SHORT!



Strega, left, and Stilleto flash by at full throttle.

Photo by Rafe Tomsett



competition. Three racers, including a couple of T-28s that did not make the original group of 27, were allowed in to take the place of aircraft that dropped out of competition due to unrepairable mechanical woes.

Thursday, Sept. 13

The big excitement on Thursday's opening day races was Steve Hinton's resounding thrashing of the Heat 1A field. He had his R-4360 powered Supercorsair really thundering from the moment starter Bob Hoover turned 'em loose and just walked away from the rest of the field. Steve just missed the Gold race last year and it was obvious he wasn't going to let that happen in '84. He finished almost 17 mph faster than the second place airplane, Bill Destefani's Mustang, and in doing so, advanced to the top tier for Friday's heats. Howard Pardue also raised a few eyebrows on Thursday, showing his Heat 1B competition the quick way around the Reno course in his stock appearing Bearcat. Robert Yancey made it an all Navy day by winning the 1C Heat in his Corsair, "Old

Blue." Pardue and Yancey likewise advanced to the next fastest groups for Friday's heats.

Friday, Sept. 14

Friday was in many respects the high point of the 1984 Reno Air Races. Normally, it wouldn't have been - but it was. The heat races are usually games of evolving strategy - a sort of cat and mouse feinting to see who has what under the cowl and how much of it one is willing to risk before payday on Sunday. For whatever their reasons, however, the real hot dogs in Heat 2A left their strategy back in the pits, rammed their throttles to the stops . . . and the devil take the hindmost!

Reno's Unlimited races are started in the air. Bob Hoover gets the field lined up off his right wing, the pole sitter next to him, heads them down the front straightaway of the course and with his now famous, "Gentlemen, you have a race!" pulls up sharply to signal the start. From that instant onward, it was all Neil Anderson and the mighty Dreadnought . . . but not without some excitement,

controversy and, ultimately, disappointment. The first trip around the course is actually just a race to the start/finish pylon to officially begin Lap One. This is all important, however, because the Unlimited rules permit passing on the outside only - unless someone has swung unusually wide - so the first plane across the line has the inside track as long as he can hold it.

As the field rounded pylon 8 and headed down the home stretch, there was no doubt about who was risking the most that day. Anderson was "standing on it", as the groundbound racers like to say, and he continued to do so through laps 1 and 2, showing the Mustangs no mercy. It was immediately obvious that owner Frank Sanders and pilot Neil Anderson were employing the same strategy in '84 that had won them the Unlimited Gold the year before . . . push the Mustangs to their Merlin's limits and use them up before Sunday. Make 'em pull 100 inches or more for 6 laps while the Dreadnought's huge 4360 was just beginning to breathe hard.

The strategy began working on lap 2. After



only about 3 minutes at full throttle, Strega's engine blew and Ron Hevle quickly had the wounded bird standing on its tail, pulling up and out of the race. Then, before most spectators could return their attention to the leaders, still another racer suddenly pulled up. Jimmy Leeward's engine had quit (he would later learn a throttle/mixture linkage bellcrank had failed) and he was about to be faced with a deadstick landing on one of the shortest set of wings at Reno.

With two maydays in progress simultaneously - Hevle landing on Runway 8 and Leeward across his path onto 32 - most of us had lost track of Anderson and the others . . . until - wow! there he was pulling up and over Ron Hevle as the latter neared the end of Runway 8, which just happens to also be the approximate location of pylon 8. And - double wow! right behind Anderson came Skip Holm. The instant impression was that both had blown - that's the only reason a pilot normally pulls up out of the race - but they simply arced up behind the grandstand area and around onto the race course again, trading their altitude for the speed

necessary to overtake the other racers on the frontstretch. So smooth were their exits and re-entries to the race course that when they came by the start/finish pylon in front of the grandstands again, both were back in their original one, two positions . . . which they held to the checkered flag. Despite his off-course excursion, Neil Anderson completed the 6 laps at a speed of 429.857 mph, almost 4 mph in front of Skip Holm. Rick Brickert was just an eye blink behind Holm, and, in turn, was followed at some distance by Steve Hinton and even further back, by John Crocker.

Then the fun began.

Initially, Neil Anderson was declared the winner . . . but a few minutes later, an announcement was made, stating that both he and Holm had been disqualified for pulling off the race course. The rules, it was pointed out, specify a 1500 feet AGL ceiling over the course and the FAA mandates a crowd deadline in front of the pit area and the grandstands. Anderson and Holm had obviously violated both . . . so the Heat 2A winner was Rick Brickert in Dago Red.

Or was he?

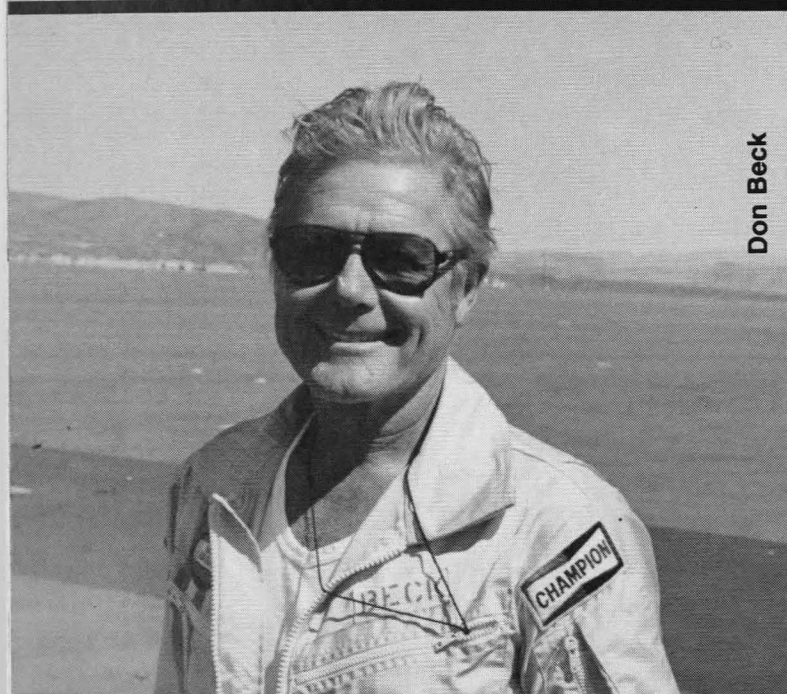
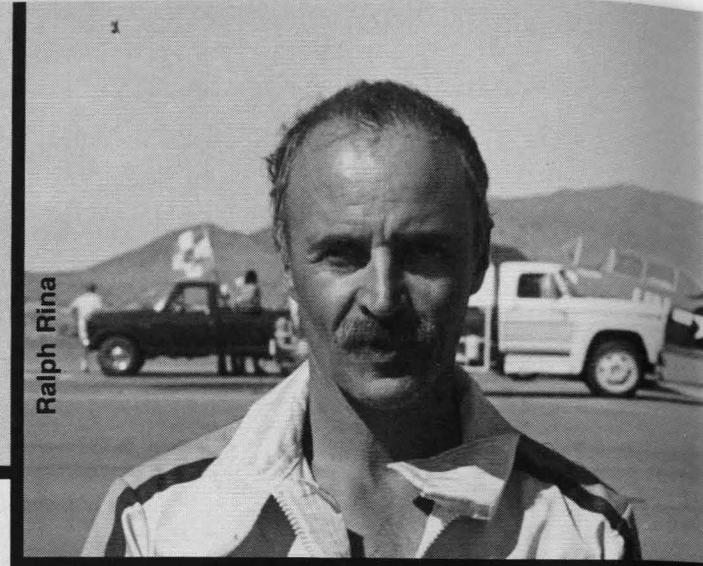
A few hours later, after they had interviewed the pilots involved, the Contest Committee, consisting of Paul Poberezny, George Wildschrey and Walt Ohlrich, reinstated Anderson as the winner and Holm as the second place finisher, stating, "Due to the confusion of two Maydays and emergency landings in progress . . . it is felt under the circumstances, the pilots displayed the best possible judgment in the few seconds they had to react. The contest committee will always give similar consideration for safety matters caused by emergency situations when pilots are faced with a similar split second emergency situation. We feel the pilots should not be penalized." In interviews following the race, Anderson revealed he never actually saw the stricken Strega landing in front of him. From the radio chatter, he knew maydays were in progress and he knew as he approached it . . . at nearly 450 mph . . . that Hevle was attempting to reach Runway 8, but he couldn't pick him out against the backdrop of a nearby mountain ridge. What he did see for an instant was



Don Beck's Mong, winner of the Biplane Championship.

Photo by Rafe Tomsett

Ralph Rina



Don Beck



The T-6/SNJ Champion "Miss Everything."

Photo by Rafe Tomsett

Strega's shadow on the ground ahead . . . and he instinctively hauled back on the stick in an attempt to clear the unseen racer. Skip Holm, seeing Neil's pull up, reacted in the same manner.

Alas, however, there would be no celebrating in the Dreadnought camp that evening, despite the dramatic turnabout of events. First, the cable that locks and unlocks the Sea Fury's tailwheel had somehow been severed when the gear was lowered for landing at the conclusion of the race, forcing the Sanders crew to have to tow the airplane back to the pits . . . and be faced with the prospect of a long night of emergency repairs. That was nothing, however, compared to what transpired next. During a routine post-race check of the Dreadnought's oil screens, the crew found them clogged with metal particles . . . both silver and steel, which was a dead giveaway that a bearing was grinding itself into powder.

The show was over for the mighty Dreadnought.

Saturday, Sept. 15

It was a stunned crowd of round engine fans that learned the bad news as they poured into the stands on Saturday morning . . . but life and racing goes on and speculation quickly shifted to which of the red hot Mustangs would now emerge as the '84 champ. Later that afternoon, Rick Brickert gave them **his** answer in no uncertain terms, not only pushing Dago Red to a runaway victory in Heat 3A, but setting a Reno course record in the process. He blistered the 6 laps at a speed of 439.832 mph, eclipsing the late Mac McClain's mark of 433.010 set in Jeanie in 1980. A bit of a surprise was Steve Hinton who finished in second place at 422.652. Just what was the big engined Corsair really capable of, everyone was beginning to wonder. It had the power - always had - but apparently had suffered some stability and control problems the last couple of years. This year a yaw dampener from a Beech twin had been installed and it appeared to be paying off in the form of more speed and less twitchiness when rounding the pylons.

Skip Holm was right on Hinton's heels at

422.490 mph and was also becoming the subject of considerable speculation. Any new racer is suspect as far as durability is concerned - you have to wonder if the builders screwed it all together properly the first time around. The Stilleto had now finished two heats with no mechanical problems, so now fans were thinking speed. Was Skip "standing on it" . . . or was he playing the strategy game and using just enough of his Dave Zeuschel Merlin to be well placed for Sunday's grand finale?

John Crocker was a distant 4th at 416.303 mph . . . and not a knowledgeable soul at Reno had the least whiff of doubt that he had been playing **his** cards close to the vest all weekend. Qualifying at 442.569 mph, just .178 mph back of Neil Anderson, John had not been close to that in the heats - obviously content to hang back, then go for the Gold on Sunday. Ron Hevle was 5th, Bill Deste-fani was 6th and Jimmy Leeward was last after cutting a pylon on the second lap.

The 3A heat did produce one ominous note . . . when Rick Brickert landed Dago Red, he had so much oil on the windshield

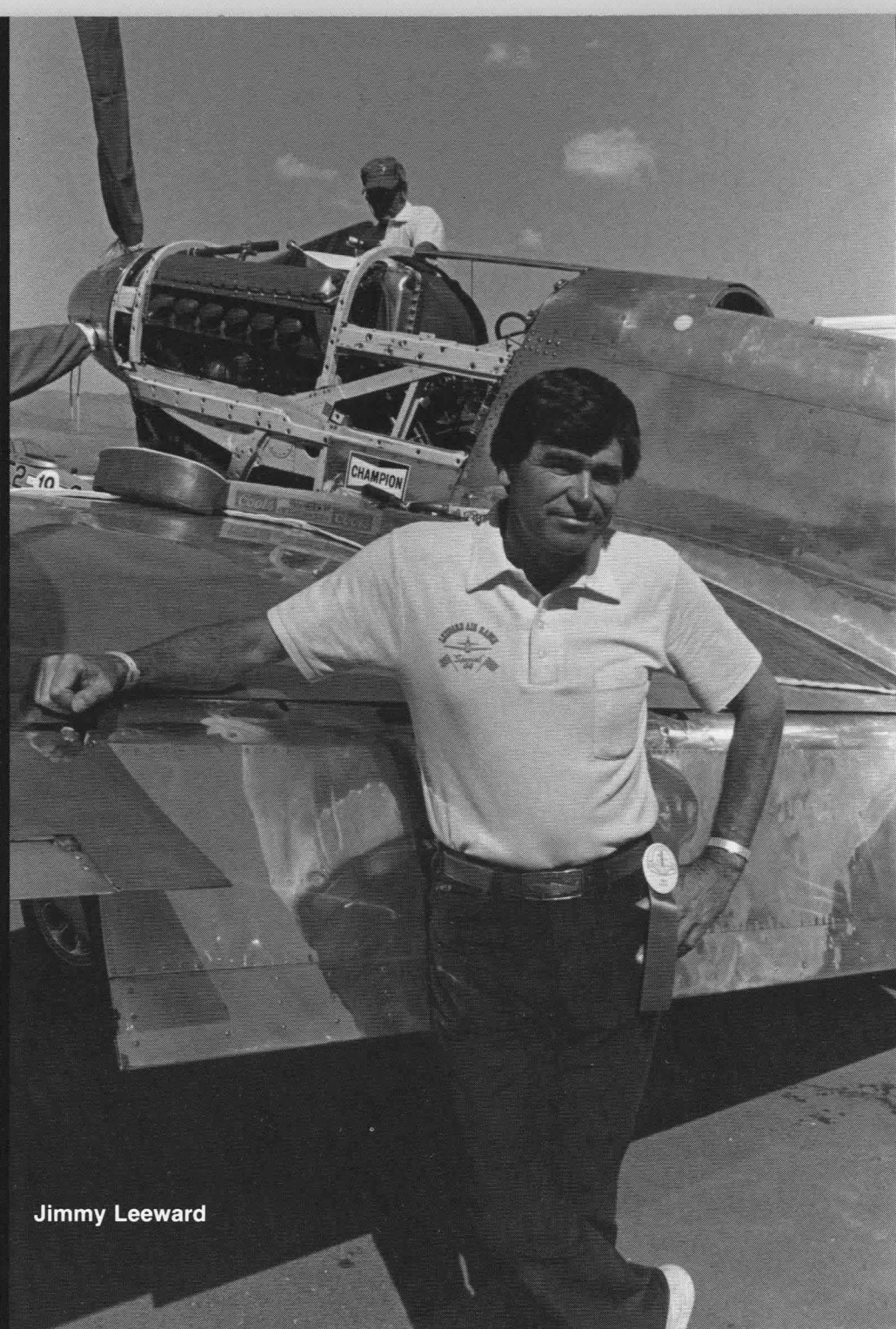


Ray Cote



Formula One Champion Ray Cote landing "Judy".

Photo by Rafe Tomsett



Jimmy Leeward

he couldn't see through it. Had he used too much of his Merlin? Would the piper be out there on the course tomorrow . . . waiting to be paid?

Sunday, Sept. 16

Sunday is showdown day at Reno. The Gold or championship races for the Biplanes, T-6/SNJ's and Formula Ones are flown and the Bronze, Silver and Gold Unlimited battles are fought to determine the national champions.

Biplanes

The Biplane wars were pretty much a Don Beck show - after the qualifying runs. Don Fairbanks put his familiar Knight Twister on the pole at 192.371 mph, a new record for Sport Biplanes (there were no Racing Biplanes at Reno this year), but Don Beck, who was close behind at 192.041 mph, won everything else. He took the Gold on Sunday rather easily in his Mong, outdistancing Fairbanks, 2nd, and Robert Hugo, who was third.

The Biplane Silver race was won by 69 year young Don Janson in his beautiful modified Smith Miniplane.

T-6/SNJ

A runaway was definitely not the case in the T-6/SNJ final. Top qualifier Ralph Rina (225.169 mph) had to battle desperately, wingtip to wingtip, first with Jim Mott, then with Dennis Buehn before inching ahead to win the Gold. This was the closest race we'd see at Reno '84 - just a tremendous show put on by skilled pilots and evenly matched airplanes.

Formula One

1984 was also an exceptionally good year for Formula One racing. 9 time national champion Ray Cote made it 10 when he won the Gold on Sunday, after taking the top qualifying spot at 238.568 mph and winning each of his heats, but he had his hands full with Tom Aslett and Jon Sharp, nevertheless. Tom was flying last year's winner, Flexi

Flyer, and Jon had a new Ken Stockbarger wing on his Cassutt, "Aero Magic". Ray's Shoestring, "Judy", was unquestionably the fastest Formula One on the airport, after a winter of modification and tweaking of the airframe and engine, but, typically, he was always the last racer off the ground in the race horse starts. He usually surged to the lead after 2 or 3 laps, but it got tougher each day. In the final, he had to pass John Dowd's Cassutt, always the first off, Jim Miller in his fast Texas Gem, Sharp and, finally, Aslett, who was getting better in his new mount with each race. Cote was absolutely determined to win the Gold, however, and flew one of the most spectacular - and harrowing - races I've ever witnessed. Once in the lead, he put on a clinic on how to fly a Formula One race course. Ray shaved every pylon clean and probably chased every jack rabbit on the airport into the next county, so low did he fly. Nobody . . . but **nobody** . . . was going to get inside or below him until he saw the checkered flag. And they didn't. Aslett tried hard but had to be content with second and Jon Sharp, who appeared to be held up by



The agony of defeat - a fire damaged Dago Red.



Rick Brickert, pilot of Dago Red.

Sadly, this is where last year's winner, the Dreadnought, ended up . . . in the pits with a failed bearing.



slower traffic as he advanced through the pack in the early going, gave it his all, also, but ran out of laps before he could catch Aslett.

All the Formula One excitement wasn't restricted to the hot dogs this year. There were some great battles in the slower heats, particularly between Lori Love, the only female currently racing, former astronaut Deke Slayton and Don Beck on one occasion and Jim Harris on another. In both races, Lori had grabbed the lead early but was gradually run down by the slower starting but slightly faster men. She finished third each time but put up one heck of a battle before loosing out on the final lap. In one race, Slayton squeaked by just a few yards from the finish line.

Jim Harris of Goldendale, WA was the Formula One Silver race winner in his modified Cassutt.

Unlimiteds

There also were some exciting moments in the slower groups of Unlimiteds. For

example, Dennis Sanders, flying the family 2-seat Sea Fury, which served double and triple duty as father Frank Sanders' air show mount and a parts runner for the Dreadnought, was making his debut as an air racer at Reno '84 . . . and capped off the effort by winning Heat 3C on Saturday. At 25, possibly the youngest race pilot at Reno this year, Dennis did a fine, smooth job of flying . . . and obviously will be heard from in future Unlimited races. On Sunday the Bronze race was won by John Maloney in his Mustang, "Spam Can II" and Skip Holm, who was racing two aircraft this year, won the Silver Unlimited race in an outwardly stock Mustang, "The Healer".

Goin' For The Gold

Then, it was time for the final shootout - the last race of the long weekend, the Unlimited Gold. Brickert, Crocker, Hinton, Holm, Hevle and Destefani were joined in the finale by Bud Granley in the Mustang, "Miss America", and Gary Levitz in Jack Sandberg's "Topsy Too" - by virtue of their

performances in the slower heats. Granley had been particularly impressive with his flying - no one flew a smoother, tighter race than Bud and no one got more out of his airplane than he did. "Topsy Too" was a Mustang everyone was watching because it was common knowledge that its engine was the prototype for the one that will be installed in Sandberg's long awaited homebuilt Unlimited, the Tsunami. A Rolls Royce Merlin, it is a "Duke's mixture" of various R-R dash number parts, including some special heavy duty stuff made during World War II for a batch of deHavilland Mosquitoes built up to chase V-1 Buzz Bombs. Fitted with nitrous oxide systems for short bursts of extra power, these engines were considered extinct . . . but Sandberg somehow unearthed a cache of parts for them. (Tsunami, incidentally, is finally nearing completion and should fly by year's end.)

The fireworks began in the usual fashion - Bob Hoover leading a line abreast gaggle of racers straight toward pylon 3. They come thundering in from behind the grandstands and usually about the time they appear over



everyone's right shoulder, Bob is pulling up to start the race. At that one instant you can see down the line of racers and can usually spot who has the jump on the rest. It was Skip Holm and the Stiletto! He had his nose down and was really accelerating.

As the pack thunders down the front stretch toward pylon 4, the viewing angle from the pits, where I was, grows so acute so quickly that it becomes difficult to judge the relative positions of the racers, but when they suddenly bank and pull hard around 4 and pylon 5 - all is revealed. Holm was out in front, and only the colorful Dago Red was close behind.

Rounding pylon 6 and heading downhill toward 7, the fastest part of the course, the angle again made it difficult to judge distance . . . but as the leaders came wailing around 7 and 8 in near vertical banks, streaming a faint mist of water from their radiator spray bars, it was Holm by about the same margin over Brickert he had held on the opposite end of the course.

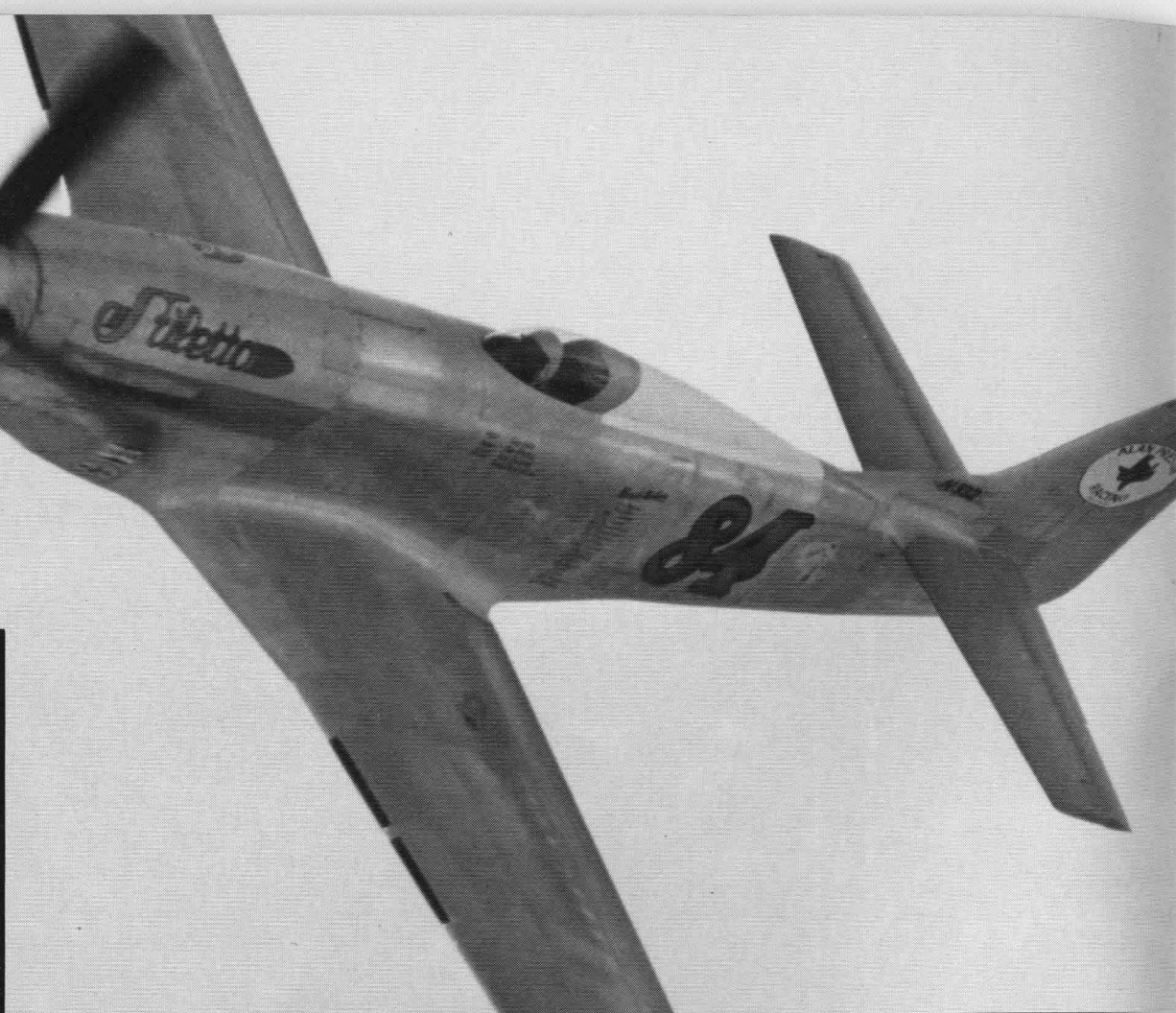
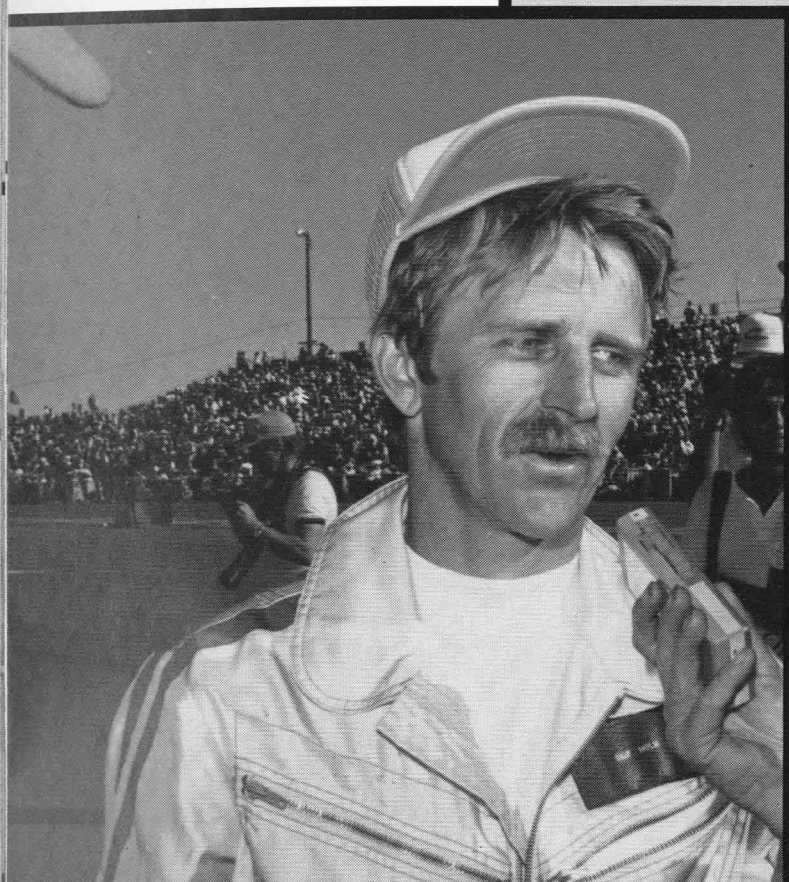
That turn, incidentally, from pylon 8 onto the homestretch is one of the most awesome

sights and sounds in aviation. When one of the really fast Mustangs or the Dreadnought comes arcing around, you **know** when the pilot is using it all. The racer will be in a constant bank all the way, from pylon 7 clear around to 3. And the sound! The Mustangs, particularly, are wailing . . . I think that's the most appropriate word to use . . . at a pitch that's quite unlike anything you've ever heard elsewhere. You don't hear prop noise - that comes after they go by. While they are still coming at you, the sound is, in part, a sort of metallic ringing. The mechanical noise of meshing, turning parts is there, but in chorus with it is this ringing . . . a resonating of metal that is being pounded to the limits its molecular structure can withstand . . . and sometimes beyond.

Bill Destefani's Merlin exceeded that limit on lap 2 . . . and the next time around, right in front of the grandstands, Rick Brickert paid the price for his course record and victory of the day before. A rod end came right through the side of the engine, sending a trail of vaporized coolant and oil streaming out behind Dago Red as Rick pulled it up

steeply to trade his 440+ miles per hour for life saving altitude . . . altitude from which to bail out or get set up to deadstick onto the closest available runway. He chose the latter.

Those of us on the ground could see the smoke, but had no inkling of the frantic situation that was developing inside Dago Red's cockpit. As the ever present Bob Hoover guided him around to the end of Runway 14, Rick realized he had a fire under the cowl. He quickly actuated the built-in, under cowl halon extinguisher, which gave him a few seconds of breathing space to concentrate on his final approach, but then the fire flared up again - this time streaming into the cockpit. On very short final, he ejected his canopy and amid the flames and heat he later said "melted his helmet visor", managed to get the Mustang on the runway. Needless to say, Rick was out of the cockpit and leaping off the wing by the time Dago Red rolled to a halt. Miraculously, he was uninjured - the mandatory fireproof flying suit, helmet and visor had done their job - and was able to yell encouragement to the fire fighters



Stilleto rounding a pylon and heading for victory.

Photo by Rafe Tomsett

Unlimited Champion Skip Holm being interviewed following his Gold Race triumph.

Photo by Rafe Tomsett

who quickly arrived on the scene to extinguish the flames . . . and save Dago Red to race another day. It was a mess forward of the firewall when I saw it in the pits late on Sunday, but owner Frank Taylor was already predicting it could be flown home to Chino, CA in three days.

Meanwhile, back overhead on the race course, Skip Holm was still leading the pack. John Crocker, finally showing some of his qualifying speed, had moved up into the second spot and appeared to be content to sit there and wait for the Stilleto to shell out its engine. Ron Hevle and Steve Hinton battled for a few laps for third and Jimmy Leeward seemed to just be cruising along in fifth place. Later, we would learn that Jimmy had lost a mag on the sprint around the course for the start of the first lap and flew the remainder of the race on the remaining one . . . still averaging 407.406 mph.

The real competition was between the two back markers, Gary Levitz and Bud Granley.

They diced back and forth for several laps, Bud getting the advantage momentarily by virtue of flying a much tighter line around the pylons than Levitz. With a lap or so to go, however, Gary obviously turned up the tap on Topsy Too's potent Merlin and put a little space between the two aircraft for the rest of the way.

On the 7th lap, Ron Hevle provided the crowd with one last thrill, blowing his engine for the second time in three days. Fortunately, his subsequent landing was less eventful than that of Brickert's.

Given the white flag at the start of the last lap, Holm had only to hold John Crocker at bay for another 98 to 99 seconds to claim his second National Unlimited Championship, which he did with apparent ease . . . an almost anticlimatic finish compared to the earlier excitement. Crocker was second, followed in order by Hinton, Leeward, Levitz, Granley, Hevle, Brickert and Destefani, the latter three, of course, placing on the basis

of when they went out of the race.

The victory was worth \$28,000, plus a little contingency money from various sponsors, for Skip Holm and his aircraft owner, Alan Preston. John Crocker's second place netted him \$18,000, Steve Hinton won \$12,000 and Jimmy Leeward took home \$9,000 for 4th place. Holm's win put him in company with Darryl Greenamyre and Lyle Shelton as the only multiple Unlimited winners since the Reno Air Races began in 1964.

Greenamyre is, of course, the all-time champ with an incredible 7 victories, 5 of which were consecutive. Shelton and Holm have won two each. (As mentioned earlier, however, no one can touch Ray Cote's 10 Formula One wins.)

Stilleto

The Stilleto is a story in itself . . . and it began at Reno only last year. Dallas developer, Alan Preston, 37, was attending the




ranes for the first time and apparently was bitten most severely by the competition bug. A friend of Frank Taylor, Dago Red's owner, he was introduced to Unlimited air racing's insiders, and, as a result, became a close personal friend of racer and Lockheed test pilot, Skip Holm. This association led him to Dave Zeuschel, noted engine and plane builder. He learned that Zeuschel and Holm had been together on Wiley Sanders' Jeannie team before that racer was sold to Jimmy Leeward . . . and that Zeuschel wanted to build an even more advanced machine and Skip wanted to race it. Preston had the resources and the newly acquired desire to put such a package of dreams together . . . so it happened. The new racer, later named Stilleto, was started right at year's end and was test flown 8 months later, in late August, by Holm. He had about half a dozen flights in it prior to taking it out on the Reno race course.

What with Jeannie (now the Leeward Air

Ranch Special) and its clones, Dago Red and Strega, not to mention Frank Sanders' Dreadnought, still on the loose, Zeuschel knew he would have to somehow squeeze still more performance out of the basic P-51 airframe if he had any hopes of producing a winner. In the end, he chose to reach back 35 years into air race history for a solution. He decided to try what Anson Johnson did in 1949 - remove the P-50's radiator and belly scoop from the fuselage and fit new ones in the wing gun bays. A lot of effort also went into weight reduction, including omission of the starter. During the races, Stilleto had to be towed to the runway and cranked with a plug-in starting rig. The racer was one of several Mustangs at Reno '84 with small diameter props (mostly cut-down T-28 blades) in order to turn higher rpm without the tips going supersonic. When they are going all out, the top Merlin powered racers are pulling over 120 inches of manifold pressure and are turning perhaps 3800 rpm. The

smaller props are intended to allow nearly 130 inches and 3900 rpm! For whatever reason, most of them, including Stilleto's, were removed and replaced by longer bladed props for Saturday and Sunday's races.

Alan Preston flew OV-1s and U-21s in Viet Nam and today has a growing collection of warbird and special interest aircraft, among them a T-28, one of the Tora, Tora, Tora T-6 "Zeros", and the MS-760 Paris jet that we saw at Sun 'N Fun in March. He recently purchased the T-6 racer #44 and qualified it at Reno at 216.684 mph, the sixth fastest time.

Obviously, Preston was a happy man on Sunday evening following the Gold race. A national championship on his first try . . . and with a brand new racer, no less . . . is going to be a very hard act to follow, but I expect we'll see a lot more of him and his team in the years ahead. 

... PROFILE OF A RACER

Jon Sharp

Wandering through the pits at Reno, one can't help noticing that most of the participants are . . . well, let's put it this way: they may not be guzzling Geritol between races but most are definitely prospects for the Grexian Formula market. Air racing is an expensive sport with few corporate sponsors, so the pilot/owner are more often than not footing their own bills. This is particularly true in the Formula One, T-6 and Biplane categories. Middle agers typically have more discretionary income, so, by and large, they are the ones who can afford to race, it's as simple as that.

There are exceptions, of course. Jon Sharp, the Formula One national champion in 1982 and third place finisher this year, is just 34. Most of the men he battles around the pylons are old enough to be his father. Jon is a native of Albuquerque and learned to fly there about 10 years ago. He started off prosaically enough in Beechcraft Sports and Cherokees, but ultimately became exposed to air racing. Falling in with a crowd building a Cassutt, he ended up becoming the designated pilot. It was important that the decision be made early in the game, because Jon is a big fellow and the fuselage had to literally be built around him.

From the outset, the Cassutt's crew has been made up of specialists - engine builders, airframe men, etc. Jon is emphatic in saying he could never have made it to Reno without the help of his friends.

For a number of years, Jon worked for George Applebay in Albuquerque. If you are not into the sport of soaring, that may not be a familiar name, so I'll tell you that George is the man who has struggled heroically for



over a decade to break the strangle hold the Germans have on the open class sailplane market. With the development of his Zuni, he has given his all to provide the USA with a state of the art machine the equal of the European glass ships, in terms of composite construction and airfoil technology. Jon was one of George's earliest employees and helped build the Zuni plugs and molds and, later, ten production aircraft . . . gaining experience and knowledge that would eventually be put to good use in his racer.

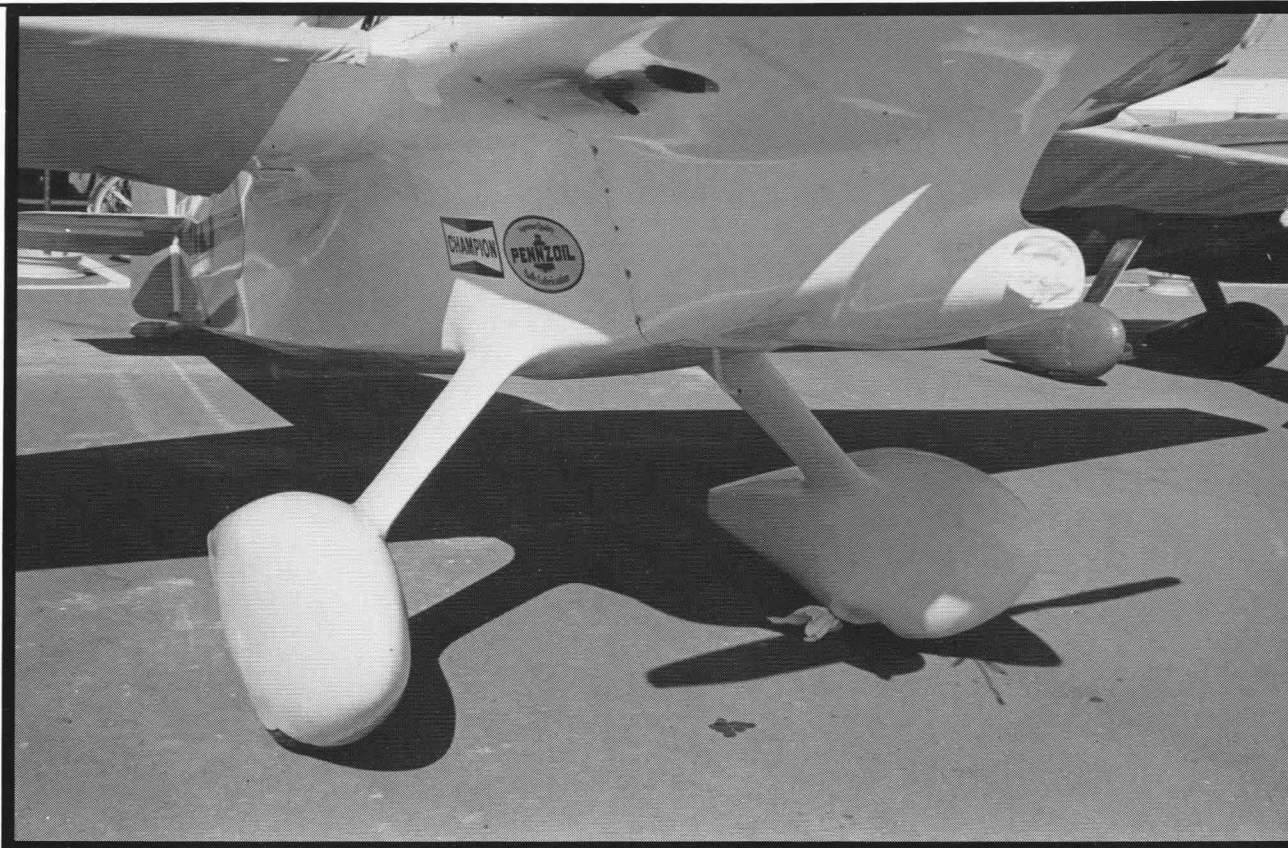
After the Cassutt was completed, it was given race number 44 and named "Aero Magic". Jon's sponsor is a firm named Aero Mag and from that evolved "Aero Magic". He raced the airplane for the first time at Mexicali, Mexico in December of 1978 and made his first appearance at Reno in September of 1979. Formula One is a highly refined sport and as such is difficult to break into as a serious frontrunner. Some of the race planes have been around since the Goodyear sponsorship days immediately following World War II and have been improved upon each season since. To step in and run with these racers and their experienced pilots and ground crews is quite an accomplishment . . . and to win as Jon did in 1982 after only 4 years of competition is little short of phenomenal.

Jon did not repeat his 1982 triumph in 1983, largely due to technological advances in some of the other racers. The winning Flexi Flyer, for instance, was sporting a new ultra thin, high aspect ratio, composite wing designed by Ken Stockbarger of Norwalk, CA . . . which gave it an obvious edge around the pylons. Upon his return home to San Marcos, TX, where he works as a propulsion engineer in Lockheed's RPV program, Jon immediately set to work to build his own Stockbarger wing . . . but employing glass sailplane technology to come up with a lighter version than others he had seen.

First, he made a plug and, from it, molds in which to form his wing. The skins are composite sandwiches - fiberglass layups on both sides of a 1/4" PVC foam core. The main spar is a PVC foam shear web covered with fiberglass, with carbon fiber spar caps. The rear spar is all foam and fiberglass. The wing is thus hollow, as opposed to the solid, core type. Having been formed in a mold, the wing parts are finished when they emerge and are very accurate in profile and dimensions.

Aero Magic's tiny ailerons are located at just better than half span, yet are so effective that Jon believes they could be even smaller. They are of all carbon fiber construction and the mass balance arms and weights are mounted internally to eliminate drag. With the thinness of the wing at half span and just over 100% balance, that was no easy task.

Testing thoroughly before departing for Reno '84, Jon pulled 9 Gs positive and 4.5 negative and had the wing to 300 mph without problems. The result of a year's work was a qualifying time of 228.490 mph, second best among 22 1984 entrants. During the heat races and final run for the Gold, Jon and Aero Magic emerged the third fastest racer around Reno's 3.108 mile Formula One course. Ray Cote and his reworked Shoestring, "Judy", were clearly the class of this year's field, and it was a toss-up for second place between Aero Magic and Flexi



Amazingly, Aero Magic's wheel pants, gear leg and fuselage intersection fairings are all one piece - not removable!

Flyer. They appeared to be evenly matched on the course, with Jon's third place more the result of a slow start and race traffic than a real speed edge by Tom Aslett and the Flexi Flyer.

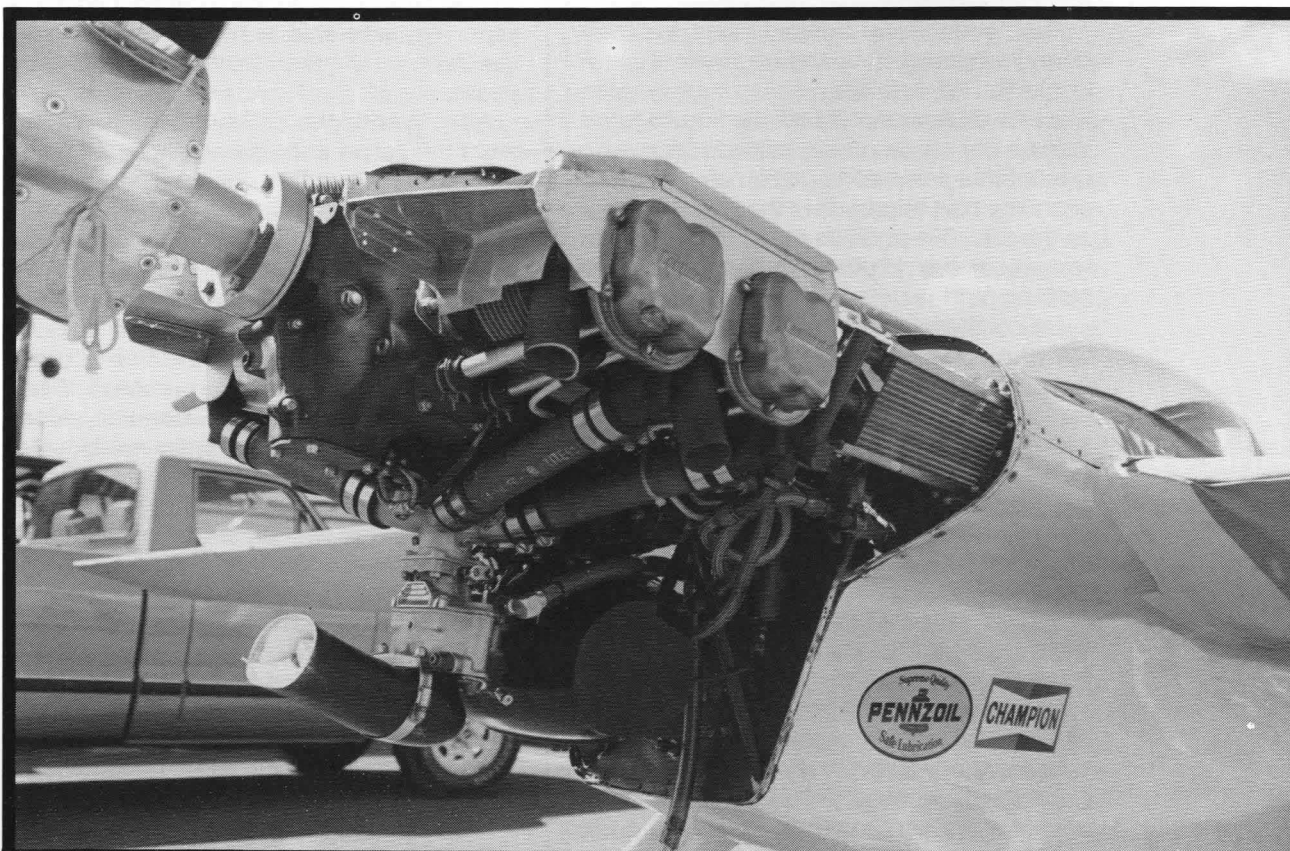
So . . . with a big improvement in the airframe this year, but still not running out front, what is in store for next year? Jon is known to want to build an all composite

fuselage that would be lighter and less draggy than his old tube and fabric Cassutt type. That might get him off and to the front more quickly . . . where the new wing and always strong engine might keep him.

New fuselage or old, however, Jon Sharp, Aero Magic #44 and his very able crew will be a team to watch at Reno '85.



Aero Magic's tightly cowled O-200.



RAY DOWNS'

Tailwind

Ray Downs and his Tailwind



The Tailwind is like its creator, Steve Wittman - ageless.

Fast, economical transportation between Formula 1 racing sites and his home base at Oshkosh, WI was what Steve had in mind when he designed and built the first Tailwind in the early 1950s. Later, homebuilders who wanted that same combination of speed and economy built hundreds of the little 2-placers as the 50s, 60s and 70s rolled by - and here we are in the 1980s and people are still building 'em!

One of them is Ray Downs of Costa Mesa, CA who spent 5 years putting his together. Actually a retirement project, his Tailwind was a means of winding down from a very active working life rather than simply plopping down in the ol' rockin' chair and vegetating his golden years away. Not that he could do that, anyway . . . Ray is currently building not one but two Corby Starlets simultaneously! One of them is for HAPI Engine's Rex Taylor to use as a factory demonstrator. Once a workaholic, always a workaholic, eh, Ray?

Like most Californians I meet, Ray is a native of somewhere else. He grew up in Tucson and learned to fly in 1937 in a J-2 Cub. Oddly enough, however, he had to travel all the way to Olympia, WA to do it.

Seems he had a buddy who had taken a job at the airport there, and joining him for a year, Ray was able to earn enough to solo the Cub . . . no mean feat in the Depression years.

After World War II Ray opened a hobby shop in Tucson and operated it for 13 years before moving on to the big time in Los Angeles. He ran Colonel Bob's Hobbies there until 7 years ago when he closed the doors for good.

Ray had done little flying during his years in Arizona, but after moving to LA, he checked out in a Bonanza and flew it "pretty hot and heavy" for business purposes. When he retired, he bought an Emeraude, which he still owned when I interviewed him this past spring.

Throughout his career as a hobby shop proprietor, Ray was an avid modeler, flying often and successfully in RC competitions. Like most modelers, he dreamed of someday building the real thing, and with the prospect of time on his hands after closing his business, he decided to make his dream a reality. He had always admired the Tailwind and when the opportunity to buy a wrecked one for parts presented itself, he snapped it up and quickly set to work on a new airframe.

He built the airplane at his home . . . which

is certainly nothing unusual until you learn he lives in a condominium. He had to rent a one car garage in the complex to serve as his workshop. The basic airframe, a steel tube fuselage and all wood wings, was built pretty much to Tailwind plans, with two major changes - folding wings and a T-18 style tubular landing gear. With the folding wings, Ray can easily tow the airplane home for maintenance or modification - or storage should he ever decide to give up this hangar at the Corona, CA airport. The gear was strictly a matter of personal preference - a stiffer T-18 type rather than the springy Wittman tapered roll type.

Ray also designed and added his own variation of Steve Wittman's latest wing tip . . . what I call a "clipped apex triangle." Rather than a metal framed, fabric covered structure like Steve's, however, Ray's are wood framed and covered with $\frac{3}{32}$ " mahogany plywood. They add 2 feet of span to each wing.

The engine is a Lycoming GPU which Ray converted to the O-290D (125 hp) configuration. It swings a 70" x 64" Sensenich metal prop. The cowl is an old Rattray fiberglass unit that has undergone quite a bit of modification. Originally one piece, which meant the prop had to be removed before the cowl



could come off, it was split into two halves for installation on N3390G and was also cut away at the top to allow fitting of aluminum access panels. A landing light was mounted just below the spinner, which turned out to be quite a task because it had to be squeezed between the starter and generator.

The exhaust stack ends that protrude into the airstream at the bottom of the cowl were flattened and drilled full of small holes. This is an old trick Steve Wittman has used for decades to quieten the bark of the exhaust without creating back pressure. It costs nothing, weighs a little less than undrilled pipes . . . and it works. You can't do better than that.

If there is a particular feature that sets Ray's Tailwind apart from others, it is the cabin - one of the plushiest I've seen. It's warm year 'round in Southern California, of course, and hot a good bit of the time, so cabin ventilation is as important a consideration as a heater is in the Tailwind's birthplace, frigid Wisconsin. Taking his cue from a Texas Tailwind builder he knew, Ray built in a "flow through" ventilation system that draws in air through a pair of NACA scoops on the sides of the fuselage, circulates through the cabin and exhausts it through

grills that look like radio speakers mounted on the rear wall of the baggage compartment. It departs the airplane through a good sized louver back on the top of the fuselage.

One of the reasons Ray's Tailwind needs such a volume of air flowing through its cabin is the equally great effort he expended on sound suppression. The entire cabin is soundproofed - lined fore and aft, top, bottom and sides with foam that, in turn, is covered with foam backed upholstery. Virtually no air leaks through so a good ventilation system was a must. The airplane thus ends up a quieter and cooler version of the Tailwind than most.

Ray, incidentally, did his own sewing on the upholstery (most builder/restorers farm that job out). He bought an old commercial sewing machine and proceeded to, first, overhaul it, then learn how to use it. He also attended a couple of workshops on aircraft upholstery at Oshkosh, so by the time he was ready to sew his, Ray was a pretty competent upholsterer. The upholstery and the airplane are orange and blue . . . and the building sequence was one in which the upholstery was done first and the exterior of the airframe was painted to match.

Fuel, which is contained entirely in the fuselage in a Tailwind, is carried in a 25

gallon nose tank (just ahead of the instrument panel) and in a 7 gallon aux tank mounted just aft of the cabin.

After completion, the fuselage and tail feathers were covered in 2.7 oz. Dacron and the wings with 1.8 oz. glider cloth. The color coat was DuPont Dulux enamel (no catalyst). The orange and blue were right out of the DuPont catalog - no special mixing.

N3390G weighs 905 pounds empty and grosses at 1450. Straight and level at low altitude, it indicates between 130 and 140 mph at 2400 rpm on an as yet uncalibrated ASI. Ground speed averages around 150-155 on cross country jaunts in moderate wind conditions. Fuel consumption at 2400 rpm is about 6.2 gph. With two aboard, the rate of climb is around 1000 fpm and solo it is up to 1200 fpm at 100 mph indicated.

When I met Ray Downs on a Sunday afternoon at Corona, he had just returned from the Merced, CA fly-in and had about 30 hours on the Tailwind. Merced was the second fly-in of note it had attended, having been flown to Casa Grande, AZ earlier in the spring, and was settling nicely into the pattern of use Ray intended for it - "just flying" weekend jaunts around the LA area and fast, economical transportation to fly-ins.





FRED GRIFFITH'S **MINIPLANE**

This is the story of a little homebuilt that has never received the nationwide recognition it deserves . . . largely because it was never flown back to Oshkosh during its heyday. Appearing on the West Coast fly-in scene in the spring of 1976, it spent two seasons winning every homebuilt award in sight - then was retired from further competition. Today, its owner brings it to fly-ins like Watsonville, parks it out away from the center of activity and spends most of his time looking at the rest of the show planes.

The airplane in question is Fred Griffith's modified Smith Miniplane, painted in the colors and markings of an early 30s Boeing P-12 . . . and crammed from stem to stern with clever and eminently practical innovations. Having been flown only about 260 hours in its eight years of existence and having received the most meticulous of care, N137G still looks brand spanking new. It would still be a grand champion contender at any fly-in in the nation, including Oshkosh.

It took Fred ten years to build 137G, from August of 1966 to May 9 of 1976 when he flew it for the first time at Mojave, CA. Even though it spent one of those years in an Allied Van Lines warehouse while Fred was away on a flying job and the equivalent of at least another year in dormancy as he moved his household on two or three occasions, the building time was still excessive for a Miniplane. It is one of the simpler of the midget biplanes . . . if built to the late Frank Smith's

original plans. Fred's wasn't . . . which will become increasingly obvious as you read the next few paragraphs. As you'll see, the wonder is he completed it in just ten years!

Fred made his decision to build a Miniplane after seeing the beautiful example built by Bob Conover and Claude Gray (which, incidentally, is also still going strong). It would be his first homebuilt, but Fred was light years away from being an "amateur" builder. An Air Force trained A&P mechanic and, at the time, a military contractor test pilot, he was certainly qualified to tackle a little 'ol Miniplane . . . or anything else, for that matter.

Having maintained a lot of airplanes in his time, Fred was particularly attuned to the need for airframe and component accessibility. Consequently, from Day One he carefully planned for and spent unthinkable hours building in quick release mechanisms for almost everything that attached to the airplane. Camlocs by the quart and nut plates by the peck were built in to allow field stripping of the airframe in minutes. The cowlings and all the metal top, bottom and side panels and inspection plates pop right off; the windshield, the seat, the instrument panel, the between-the-knees console and the cockpit floor are only a few flicks of a screwdriver away from lifting off or out of the Miniplane and even the fuselage fuel tank is easily removable. A lot of little biplanes have to have the top wing removed to get at the

fuel tank.

It's a good thing all this accessibility was built in, considering the goodies found inside. Up front, the engine is a real relic of the early days of the modern homebuilt movement. It's a Lycoming O-290G, or just "GPU", as we used to call 'em. Lycoming used to supply the military with a "ground power unit" propelled by an "industrial" version of its O-290 flat four. It was pretty much like the stock aircraft engine except for a big flange on the nose of the case. When they were sold as military surplus, homebuilders snapped them up, usually for very low prices, sawed off the flanges, made a few minor changes and bolted them on their homebuilts. For much of the 1960s, the GPU was **the** homebuilder's engine and a number of airplanes were designed around it, most notably perhaps, the T-18 . . . at least John Thorp's original concept of what the T-18 would be. Properly converted, the GPU made a good little airplane engine and a lot of them are still flying today.

Fred's GPU was converted by Ernie Schultz, an old timer who once was crew chief on the Winnie Mae for Wiley Post. In his late 80s, Ernie was still overhauling engines in his own shop when Fred told me about him at Watsonville this spring. Fred is quite proud of his engine because of Ernie's association with it - and it has always performed flawlessly.

Fred added a few goodies of his own to

the engine - a cross-over exhaust system with ball joints in each of the tailpipes, a breather tube that runs down a gear leg to keep oil off the airplane's belly and a redesigned cowl, just to name a few. The reshaped cowl was part of a complete recontouring of the top line of the fuselage, eliminating the straight lines of the typical plans-built Miniplane.

The landing gear was revised considerably and the legs were covered with metal wrap-around fairings. Goodyear wheels and disc brakes were fitted, using 6:00x6 low profile tires running lower than normal air pressure. Fred has found the Miniplane to be a little less skittish on pavement with low pressure in the tires.

Fred also devised a parking brake, with a simple release mechanism in the cockpit that's easy to reach from the outside.

The standard Miniplane fuselage tank is supposed to hold 17 gallons, but Fred's is full with just 16 aboard - not enough to be hopping over California mountain ranges. Consequently, he has built a 7 gallon "bomb" aux tank that hangs between the landing gear legs. Made of fiberglass, it is internally baffled and feeds directly to the engine like a "main" tank. Stressed for 4 Gs and up to redline speeds, it has its own screen and sump drain. Held on its mounting pylon by 2 bolts, it can be removed (or installed) in about 10 minutes.

Once you poke your noggin into the Miniplane's tiny cockpit, things REALLY begin to get interesting. Look closely and you begin to pick out stuff like low pressure fuel and oil warning lights, blue/white instrument lighting, dual volt/amp meter, map light, map case, EGT, electric OAT, true carb air temp, MP gage, G-meter, transmitter output light for the 360 radio, VOR head, transponder (Fred used to fly the Miniplane out of the Burbank, CA airport and needed it), switches for strobe and nav lights, folding arm rests - and a fighter-type stick grip festooned with buttons and switches. The "trigger" switch is the mike button and the "trim" switch is just that . . . electric trim on a Miniplane! While doing a test flying stint in Canada, Fred was given a linear actuator off a big airplane of some sort and he used it to trim the stabilizer of the Miniplane. It works - so well, in fact, that he can loop the airplane with the trim button!

What else? A mechanical (magnetic type) fuel gage, baggage compartment, rear view mirror, alternate static source for the airspeed indicator (which Fred says is needed even in an open cockpit airplane), a Hamilton Vertical Card compass, check valves in the vented fuel caps of both the main and aux tanks to prevent fuel venting when inverted.

Can you believe it - all this stuff in a 15.5' fuselage? Believe it, it's there - and exhibiting the highest level of workmanship to boot.

The Miniplane's wings are essentially standard, except for reshaped tips and the addition of a second set of "negative" tie rods. With the latter, the airplane is stressed for 9 Gs positive and negative.

Fred covered the airplane with Dacron, applied and largely sanded off 10 coats of nitrate and butyrate dope and finished it with acrylic enamel. His father was an Army Air Corps pilot and flew P-12s with the 18th Pursuit Group out of Wheeler Field in Hawaii in 1933. The Miniplane was painted to repre-



sent one of the Boeing fighters of that Group - with a couple of personal liberties Fred chose to take. The markings are authentic but are a composite of what appeared on different airplanes in the Group . . . and the eagle is a more handsome bird. Fred thinks the 18th Group's eagle looked more like a turkey buzzard than our national symbol, so he had an artist paint a more noble bird on the sides of his Miniplane. The basic olive drab and several trim colors are absolutely authentic, Fred says - checked out at the Air Force Museum and various paint manufacturers by his father.

Despite all the goodies, the Miniplane came out weighing 791 pounds. Fred says he considers "empty" weight to be the airplane ready to fly, minus the pilot, so the 791 pounds includes full fuel and oil. With the Lycoming O-290G modified to the O-290D configuration and swinging a Great American prop (of course), the little biplane cruises at 120 mph TAS. It stalls at 65 mph and with 23 gallons of fuel on board has a max endurance of 3 hours and 15 minutes.

With Fred's reshaped wing tips, the span is 17 feet 4 inches.

Fred Griffith has had quite a career in aviation - and only recently embarked on still another chapter. A native of Baltimore, he grew up airplane crazy like the rest of us (you wouldn't be reading this magazine if you hadn't). He lived within bicycle range of an airport, so every "spare" moment of his young life was spent sweeping floors, washing airplanes, hitching rides with anyone who would let him tag along . . . and getting a little stick time here and there. At the tender age of 13, a miscreant, who shall forever remain nameless, took him out in the boonies in a Cub and soloed him. He got his private license as soon as he was old enough to qualify and after high school graduation, went immediately into the Air Force. That was in 1948.

After mechanics school at Chanute Field, Fred spent 3 years as a line mechanic, passing alternately through the eras of the P-51, F-80 and F-84. He mustered out of service at the end of his first 4 year hitch but spent



Fred Griffith shows off his fuel cap with a check valve in the vent line.

only a short time in civvies before being recalled during the Korean War. This time around, he was assigned to the atomic testing group in New Mexico and was involved in the above ground tests carried out in the Pacific during the 1950s.

In 1952 Fred had taken up sky diving as an off hours hobby and when Uncle Sam learned about it, he was sent to El Centro, CA to spend the next 3½ years testing parachutes, ejection seats and other escape paraphernalia.

Surviving that tour, Fred again left the Air Force and in the late 50s enrolled in an air line pilot training course with American Flyers at Ft. Worth, TX. Graduating in 1959, he signed on as a pilot for Capital Airlines . . . but found that kind of life too tame compared to this earlier experiences. For much of the 60s Fred was an aviation jack-of-all-trades - he dusted crops in West Texas, flew corporate planes out of Pittsburgh, flew charter from Phoenix, flew the 60s singing group, the Four Preps, to one night stands all over everywhere in a deHavilland Dove . . . and even took a brief flyer as a show biz personal manager.

Finally, however, Fred found his niche. He landed a job as a military contractor test pilot with the Pacific Airmotive Corporation based at Burbank, CA. For the next decade and a half, he was in a pilot's version of hog heaven - flying all sorts of interesting airplanes: re-engined piston air liners, U. S. certification

tests of some of the early English and French corporate jets, special research projects for the military and much more.

After retirement from Pacific Airmotive, Fred moved north to the clean air of San Luis Obispo and became a member of EAA Chapter 170 there. The Miniplane went with him, of course, and through its need for a more efficient propeller, he embarked on his latest aviation adventure. The Great American Propeller Company was located in nearby Oceano and pretty soon he was working with its management to fine tune its products. Last year, he became the president of the company and, characteristically, has thrown himself 100% into the new endeavor. He still does a lot of test flying, but now its mostly for his fellow Chapter 170 members. He has lost count of the number of homebuilts in which he has made the initial flight . . . or has flown to check out the rigging, engine cooling or whatnot.

Fred says there was never a day in his life that he intended to do anything that was not associated with aviation in some fashion . . . and looking ahead, he doesn't see any reason to change. He is currently building a Dyke Delta in what little time he can squeeze away from the propeller business. Don't look for it at a fly-in anytime soon, however. With the internal volume of that airplane, imagine the goodies Fred is building into it . . .

Mercy!





On The Price Of Propellers . . .

Why are propellers so expensive? Sure, they have sensuous curves and lustrous finishes, but two or three hundred dollars - often more - for a 50 or 60 inch piece of laminated wood with a half dozen or so holes bored in its midriff?

During my interview with Fred Griffith, we meandered off a couple of times into conversations on propellers . . . natural, I suppose, considering the fact that Fred is president of the Great American Propeller Company. Among the tidbits of information I picked up was the fact that the Long-EZ propeller is Great American's best seller . . . and that it currently sells for \$320.00, plus shipping charges. With a captive answer man in my clutches, I put the question to Fred - what makes it cost that much?

Right off the top, I learned a Great American Long-EZ propeller takes 14 working days to make! That astounding revelation alone ended any argument I might have had concerning cost. Even though a good share of those days is largely for curing and drying time for the various adhesives and finishes, still someone who is being paid a salary is handling the prop each day, the lights are on in the building, the phone is ringing, the toilet is flushing, the interest meter is running down at the local bank . . . overhead marches on.

And there's more to the process, of course, than mere time. Great American's marketing strategy, Fred told me, is to provide the **best** propeller he and his employees are capable of making . . . and that implies using the best materials available. There are no knots in any of the wood in a Great Amer-

ican propeller, and in order to get that kind of quality, Fred orders his blanks from an outfit in northwestern Wisconsin called Birchwood Manufacturing. Birchwood has an FAA approved manufacturing process for making its certified propeller blanks and Great American's blanks go through it, also, even though they are destined for use on homebuilts. They consist of 1/8" laminations of Canadian maple bonded together with old fashioned resorcinol glue.

Once in California, the blanks are mounted on a spiral cutting machine which roughs out the familiar prop shape, one side at a time and at a rate of about one inch per minute . . . or about 3 hours per prop.

After being removed from the spiral cutter, the prop blank's ends are cut off and the remaining roughed out club is set up for pitching. A workman begins scraping down the back side of each blade, checking periodically with a protractor to determine if the proper blade angles have been achieved.

After the pitching operation comes the shaping and sanding of the rest of the propeller and drilling the hub, a hand operation that averages 6 hours per Long-EZ prop.


Then, finally, comes the finishing process - **WHICH TAKES 11 WORKING DAYS**. The first step is to apply a layer of Kevlar on both sides of both blades (I'm using a 2-blade prop as an example, but Great American also makes multi blade props of many configurations). Only one side can be done per working day - it has to cure overnight before the prop can be turned. After the Kevlar layups are completed, the entire prop gets 5

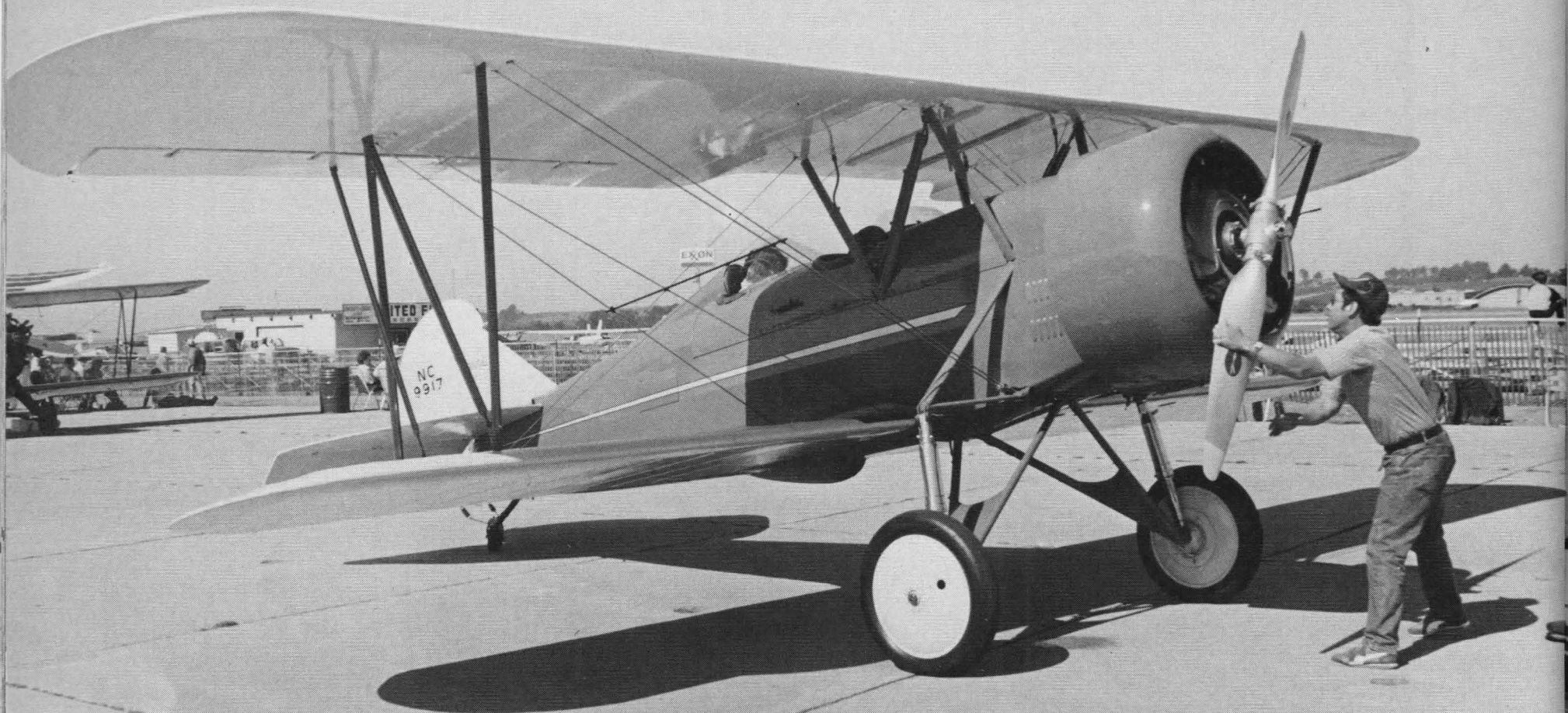
coats of a very expensive 2-part polyurethane (as much as \$150.00 per gallon) . . . one per working day, with curing time and a lot of sanding separating each.

The final day is for balancing and to allow the tip color to dry.

Unfortunately, Great American's problems are not over when the propeller is completed. Shipping them to customers is a major hassle. They normally go out via UPS at regular rates - providing the package is no longer than 52 inches. Above that the rates **double** and if too long, UPS won't accept them at any cost. Then they go by motor freight, with generally longer delivery times. Shipping cost is a flat \$20.00 for most propellers.

Currently, Fred told me, Great American is beginning to use a new British airfoil section in its props. It is difficult to make, he says, with lots of under camber and very thin blades. "We are bringing our wood thickness down to 8% (of chord), which used to be unheard of in wood props. One of our goals is to back down to the engine manufacturer's spec rpm ranges, rather than up around 3,000/3,100 where a lot of people are running. We want our props to get their performance in the lower, more efficient range (below 2700 or so)," Fred confides. He is proud of the cruise performance of his props, often several miles per hour faster than others. The pitch, blade shape, airfoil, etc. are optimized for the mid range where most flying is done.

For further information on the Great American Propeller Company, write or call 1180 Pike Lane #5, Oceano, CA 93445, phone 805/481-9054. 



Travel Air

It's hard to stand out in the crowd of beautiful showplanes that turn up at the Watsonville, CA Fly-In every spring, but one that did this year was a 1929 Travel Air B9-4000. Just restored by its owners, Stu Mitzel and his son, Mark, of Oregon City (Portland), OR, NC9917 was absolutely resplendent in its fresh coat of cream and orange IMRON. The weather was unusually good that Memorial Day weekend and in the bright sunshine the Travel Air's colors seemed to epitomize the warmth and fun and airmindedness we Easterners tend to expect of California. It was **gorgeous!**

It was also rare . . . the only example of the type I've ever seen. The B9-4000 was a special high powered version of Travel Air's standard production line radial engined biplane, the B-4000. It had a 300 hp, 9 cylinder Wright radial up front instead of the B-4000's usual 200 or 225 hp Wright. According to company records, only six serial numbers were set aside to be assigned to B9-4000s . . . and at nine thousand 1929 dollars each (probably around a hundred thousand in today's dollars), there likely was little call for more of them. Just two have survived: NC8717, Serial Number 1001, currently registered to David Williams of Vacaville, CA and NC9917, Serial Number 1103, owned by the Mitzels.

The model B9-4000, incidentally, will not be found in standard references like Juptner's **U. S. Civil Aircraft** . . . because it was never awarded an Approved Type Certificate (ATC) of its own. Instead, it was permitted

to fly under what was once called a "Group 2" approval. These were, in effect, amendments to existing ATC's and in the case of the B9-4000, its Group 2 approval, 2-381/1931, was an amendment to the B-4000's ATC #32. An oddity is the fact that although all the B9-4000s were built in 1929, the Group 2 approval was not granted by the government until 1931. Wonder what their legal status was in the interim?

Whatever, the B9-4000, with its high power to weight ratio, became a favorite of skywriters in the 1930s and even briefly after World War II. No less a personage than the late Big Nick Rezich once spelled out "Pepsi Cola" high over Chicago in 9917. Before his recent passing, Nick sent Mark Mitzel a picture of the airplane, taken sometime in the late 1930s. In it, his brother, Frank Rezich, is shown sitting on a wheel of ol' 9917 and the words "Pepsi Cola" are emblazoned on the tail. (And just to illustrate what a small world aviation really is, Frank Rezich lives in California today and is usually at Watsonville. He is also one of your fellow subscribers to **Sportsman Pilot** . . . so, Frank, whatever you can tell us about 9917, we're all ears.)

After the war, 9917 ultimately suffered the more fortunate of two fates seemingly reserved for the remaining biplanes of the 20s and early 30s . . . being scrapped or turned into a crop duster. 9917 became a duster and, no doubt, exists today because, as a money maker, there was a reason to preserve and maintain it. Little is apparently

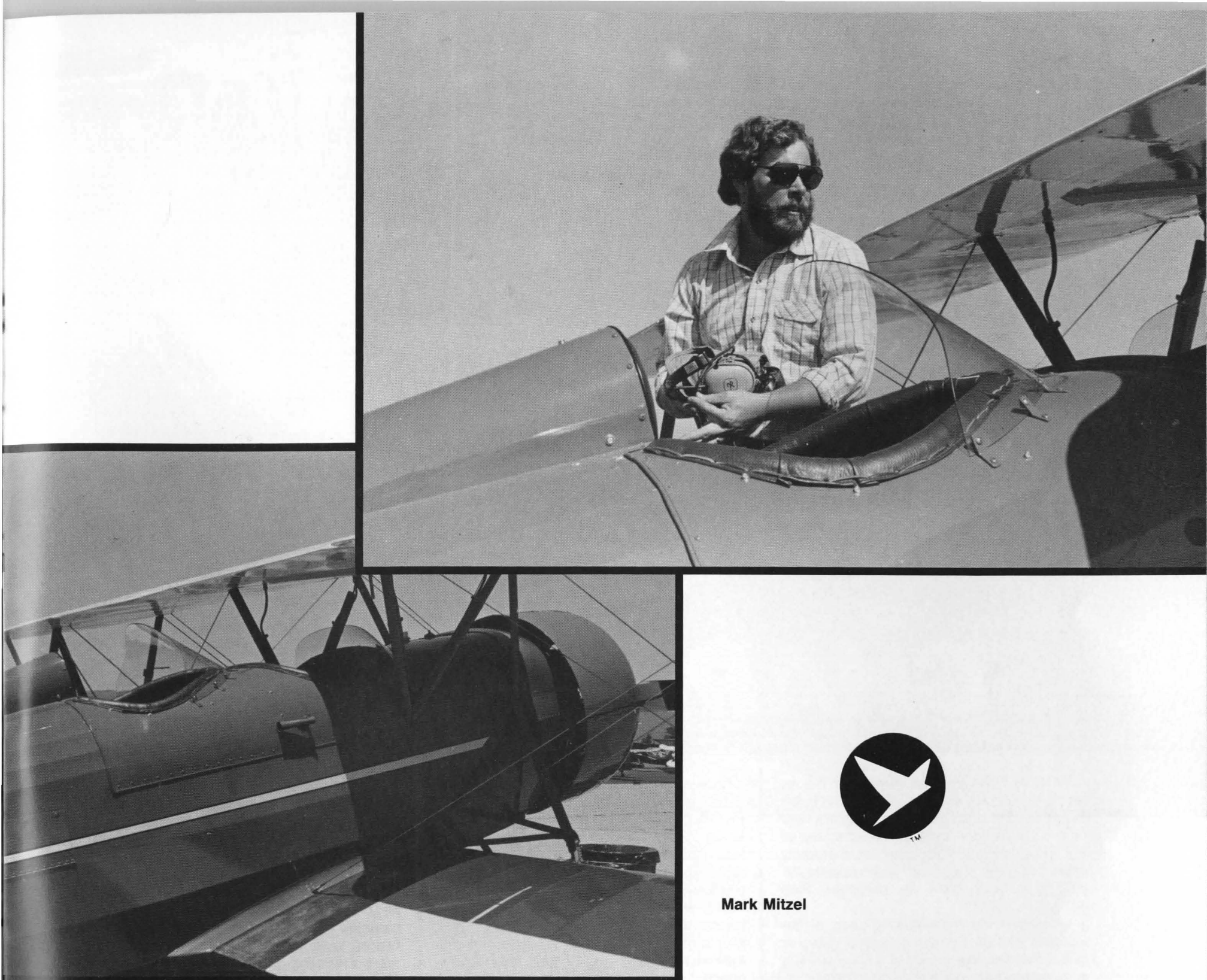
known about the airplane during its years as an ag plane . . . they normally lead rather anonymous lives while out dragging their wheels through a cotton patch. The only record I could dredge up was the fact that in the mid 60s 9917 was registered to Paul N. Hansen of Warrenton, OR and was not then airworthy because no annual inspection had been reported in the past year.

Our restoration stories are, however, like fairy tales, in that they usually have happy endings. 9917 ended up in the hands of the Mitzels, who are in the business of breathing new life into old (and not so old) airplanes, and was saved to live yet another life, this time as a pampered show plane.

Ol' 9917 was stripped down to bare metal and rebuilt to factory new standards. All the wood is new and the few systems, such as the hydraulic outrigger landing gear, were overhauled. It was covered with Ceconite and finished, beautifully, in IMRON.

The engine of 9917 is not the J-6-9 of the 20s or even the more modern Wright R-975E it had when registered to Paul Hansen. The Mitzels chose to substitute a Wright R-760-8 that's rated at 235 horsepower because it burns less fuel and is a more reliable engine, according to Mark. Fitted with a Hamilton ground adjustable propeller, the R-760 cruises the Travel Air at an easy 120 mph, burning between 13 and 14 gallons per hour. With a total fuel capacity of 63 gallons, endurance with a half hour reserve is 4 hours.

N9917 is somewhat unique in appearance in that it sports a NACA cowling. Not many



Mark Mitzel

Travel Airs had one, but "deluxe appointments", such as cowlings, wheel pants, "speed wings", etc., were available in 1929 at extra cost, so 9917 **could** have been so fitted. Its cowling, however, came off a Fairchild 45 (a rarity in its own right) that was having its Wright engine replaced with a P&W R-985. The wheels are from a N3N and have hydraulic brakes rather than the B9-4000's original mechanical binders. The new ones are almost too good, Mark says. 9917 was restored with a tailskid in place, but was never flown with it. A Scott 3200 tailwheel was installed, in deference to latter day airport managers who do not take kindly to having their heat softened asphalt runways and ramps furrowed to a fare thee well on hot summer days.

Mark Mitzel flew 9917 to Watsonville '84 and thus was the half of the ownership duo who had to undergo my interview. I found him to be a veritable walking encyclopedia of antique airplane lore - particularly in his recall of N numbers. His father, Stuart Mitzel, has operated his own business, Stu's Aircraft, Inc., since about 1961 and Mark liter-

ally grew up in aviation. He has his A&P license and has been working with his father for 10 years or so. His work **has** to be right because his dad is the IA who has to sign it off!

The firm rebuilds all kinds of aircraft (Mark was working on a Super Cub at the time I talked to him at Watsonville) but they specialize in the old biplanes. They have restored 3 Travel Air Speedwings, for instance - both the B9-4000s that survive and a Travel Air D-4D, NC5426. The latter has quite an interesting history. It was originally a Hisso powered 3000 and was used by Louise Thaden in an attempt to break the woman's endurance record. Later, it had its "elephant ear" wings removed and was fitted with a set of round tipped speedwings, making the airplane a D-4000. Still later it was converted to a D-4D by the substitution of a Wright J6-7 for the Hisso. Many years later, it was restored by the Mitzels and sold to the Pepsi Cola company for use as a skywriter. Pepsi changed the N number to 434P . . . to go with 434N, a second Travel Air D-4D the firm owns and operates in its advertising pro-

gram.

The Mitzels have also restored a 1931 Bird CK for Gene Frank of Caldwell, Idaho . . . and, in turn, bought a Waco ASO, NC608N, from Frank. This airplane was purchased new in 1929 by Texaco to serve as a tow plane to haul Frank Hawks across the U. S. in a glider. It is currently being restored and, Mark says, should be flying next spring.

Other antiques owned by the Mitzels and awaiting restoration are a Travel Air L-4000 and a TA E-4000. One will be restored as an elephant ear model and the other as a speedwing.

There are a surprisingly large number of Travel Airs, Wacos, early Stearmans, etc. in the Northwest . . . because they were used there until relatively recently as dusters. Fortunately, the area also has a number of restoration shops like the Mitzel's to give them new lives as antique show planes.

If any of you are in need of their services, contact Stu's Aircraft, Inc., 20015 South Leland Rd., Oregon City, Or 97045.





SCHAPEL ULTRA WING

While at Reno's Stead Airport for the air races, my friend Ken Brock, Golda and I took the better part of an afternoon away from the pit area to wander down to the other end of the huge ramp to look over an extremely interesting new project, an all composite flying wing, and meet its designer, Rod Schapel.

We found the experimental shop of the Schapel Aircraft Company spread out over about half the floor space of what I assume is a hangar left over from World War II . . . the other half was full of racers, including Lefty Gardner's P-38, which was in the midst of an engine change. Interesting place.

Most interesting of all was the flying wing, the SA-882. It is a single place machine configured much like the Northrop flying wings of the 1940s . . . but outward appearance is where the similarity ends. The SA-882 has an extremely complex computer derived shape that would be next to impossible to form in anything other than composites and it is powered by a modified Mazda RX-7 rotary engine driving a composite propeller through a long drive shaft. It has a fixed tricycle gear . . . and no vertical surfaces of any sort, other than the fairing for the prop shaft and its mounting structure.

The SA-882 is essentially a one piece airframe - a swept back wing with provision for a cockpit and engine compartment at its center. The span is 34 feet and the leading edge is swept 34 degrees. The thickness ratio at the centerline is 18.5%, tapering to 9% at the tips. From the $\frac{2}{3}$ semispan **outward**, the wing has a straightline taper; however, inboard from there to the centerline, it is a parabolic shape. There is a great deal of twist built into the wing . . . and the struc-

ture was designed more with stiffness in mind than the usual stress levels to insure that the tip angle will not change under flight loads. The entire airframe (wing) was, in fact, analyzed by the computer every 10 inches of the span! It is stressed for 6 Gs positive and 4 negative.

The wing is made by laying up top and bottom skins in molds and heat curing them in a large oven. The skins, themselves, are sandwiches consisting of PVC foam cores covered on both sides by epoxy impregnated fiber glass.

The control system consists of three hinged surfaces on the trailing edge of each side of the wing. The outboard surface is an aileron - with a little elevator mixing. The middle surface is an elevator and the inboard surface is the rudder . . . yes, a **horizontal** rudder. Actually, there are **two** of them on each side of the wing, one on the top surface that moves upward and a separate one on the bottom that moves downward - like split flaps on both the upper and lower surfaces. In truth, they are drag brakes, but function as rudders. They are located inboard near the MAC to avoid the pitch-up that would occur if they were outboard on the washed out tips. They also can be much larger when located inboard and thus more effective at slow speeds.

The engine is basically an internally unmodified 2-rotor Wankel from a Mazda RX-7, fitted externally with a Ray Jay turbocharger, fuel injection from a 6 cylinder Continental Tiara (Rod has 2 of 'em), custom made intake and exhaust manifolds and a 2.041 to 1 reduction gearbox. The reduction unit looked familiar to Ken and I and Rod confirmed our speculation - it is a Nova ultralight

reduction unit, redesigned and built to Rod's specifications to handle 180 hp continuously and up to 250 hp intermittently. The Nova housing contains a special helical gearset with one inch face widths, lubricated by a dry sump system that sprays oil directly on the gears. The turbocharger bearing also had to be pressure lubed . . . and a remotely mounted filter is employed to keep clean oil flowing to all these critical components. Still another gearbox is used to drive the Continental fuel injector pump - necessary because the Mazda will turn up to 6,000 rpm in the SA-882, twice that of the Tiara and 3.5 times faster than the pump turned in that engine.

Rod wanted 180 hp from the Mazda, so it was not necessary to modify it for high rpm like the auto racers do. He has operated it on a dyno for over 6 hours at high power settings and is confident it will be a reliable powerplant for his flying wing. He knows he is defying the unwritten rule that says you never run an untried engine in an untried airframe, but he believes that his testing combined with the experience of auto racers makes the Mazda much more of a known quantity than other "experimental" powerplants.

Power is converted to push by a 3-blade 52 inch ground adjustable propeller with Kevlar blades made by St. Croix Propellers. Schapel Aircraft designed and built the hub. At 3,000 rpm the prop is 85% efficient, Rod says. The drive shaft employs a metal/rubber coupling to cancel torsional resonance and has a disc brake from a Honda motorcycle to stop the prop in the event the pilot has to bail out.

The prototype SA-882 pictured here is pro-

jected to weigh 875 pounds empty . . . yet it is a proof of concept airplane for an **ultraflight!** Rod explains this puzzler by saying, "We designed the airplane a couple of years ago and interested some people in LA, Wing Research Corporation, and sold limited partnerships to raise the funds to build the aircraft as an ultralight. It's not an ultralight, but the planform and the airfoil were designed specifically for that application. I said the only way to do it is to build a 'heavy' prototype, prove it - **then** do the ultralight. We think we can meet the 254 pound weight with this configuration. It will be a solid, controllable airplane, not a toy built out of sticks and stones."

When we saw the flying wing in mid-September all the parts and pieces had been built and the engine was sitting on a bench awaiting installation in the airframe. Workmen were busily . . . and noisily . . . cutting out the opening for the cockpit in the composite skin. There was no specific target date for completion, but Rod said he was down to counting weeks rather than months and years until the airplane was ready for flight.

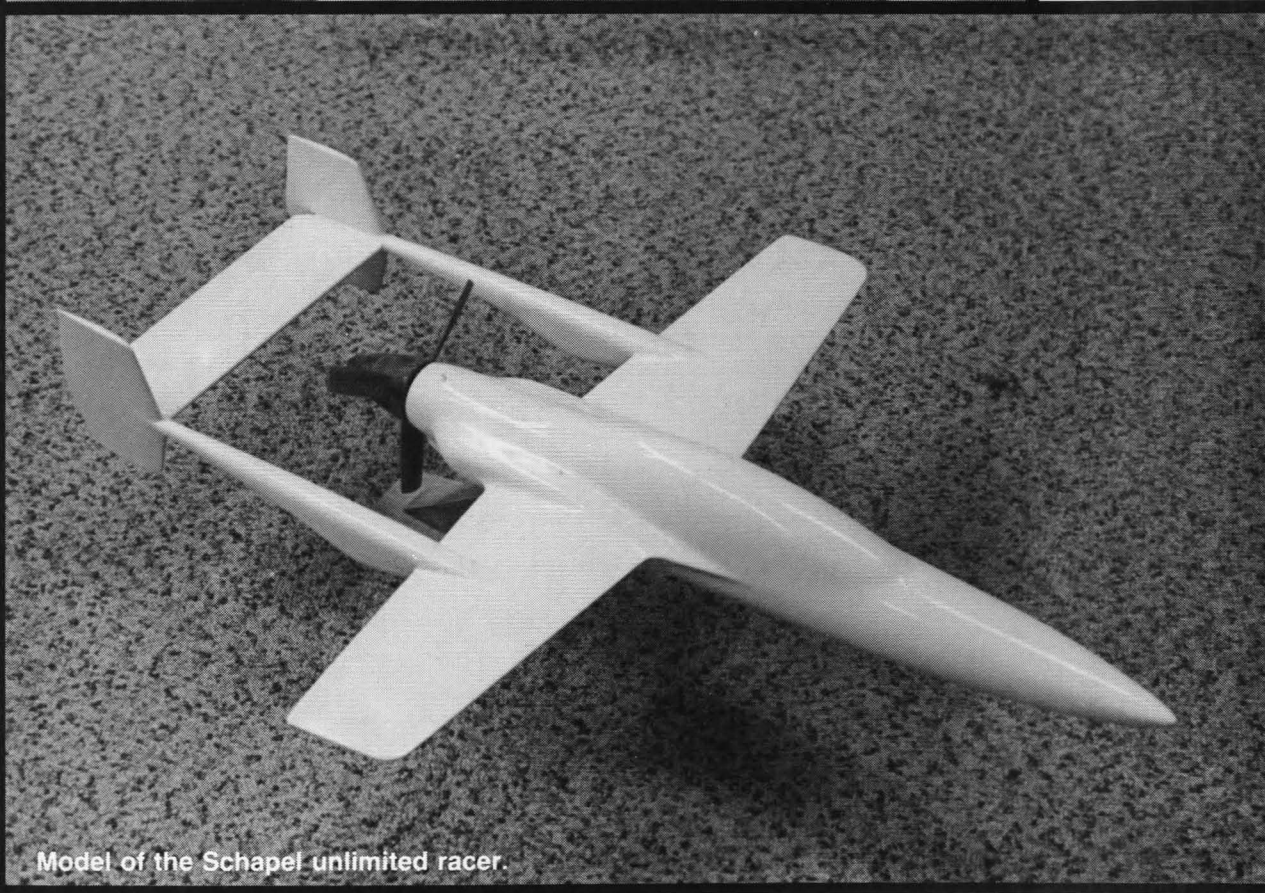
Ron Schapel is a native of Southern California, grew up and was educated there, earning a mechanical engineering degree. He spent a number of years working at Douglas as a project engineer on various fighter and attack aircraft. Later, he formed a small company of his own that built rotating machinery for the aerospace industry. He also designed a couple of large racing sailboats and was working on a nitrogen liquifaction plant when he was summoned to Reno in 1976 by Bill Lear to design a corporate jet intended to be an improved follow-on to the Challenger. That project was never completed because Lear decided instead to build the LearFan. Rod told Ken and I that he did the preliminary layout on the LearFan largely at home and on his own time . . . and had a couple of go-arounds with Lear before it was finally accepted.

Rod left Lear late in 1977 and opened Schapel Aircraft at the far opposite end of the Stead ramp from Bill Lear's operation. Initially interested in designing and building an ag plane, Rod has come up with a number of additional design concepts over the last few years, including an unlimited racer he thinks can outrun the modified warbirds with a Stage 2 engine, the aircraft version of the aluminum Chrysler Hemi clone. (A plug for the racer's fuselage was sitting out in full view in the loft area in his shop.) With just 70 square feet of wing area and weighing 190 pounds, the racer is a tiny thing compared to a Mustang . . . but that's one of its advantages - low wetted area.

Ken, Golda and I were also given a tour of Rod's offices. Liberally stocked with computers and computer driven design equipment, with drawings all over the walls and



Rod Schapel



Model of the Schapel unlimited racer.

models of all sorts of new concepts sitting around on the desks and tables, the place was enough to set any airplane nut's pulse to pounding. Mine certainly was.

Hopefully, the little flying wing will be the key that opens the right doors to get more of Rod's ideas into the air.

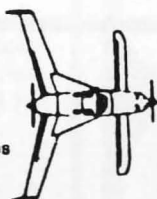


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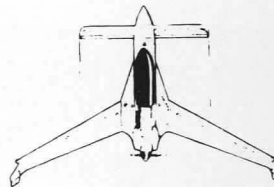
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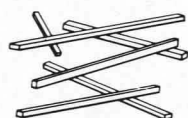
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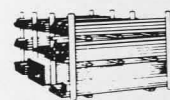
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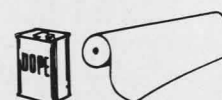
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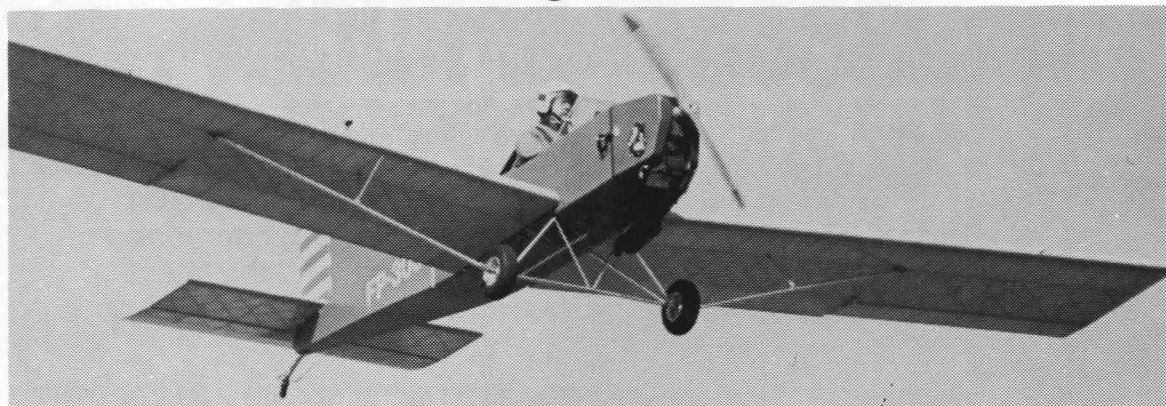


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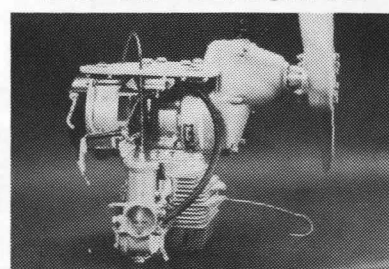


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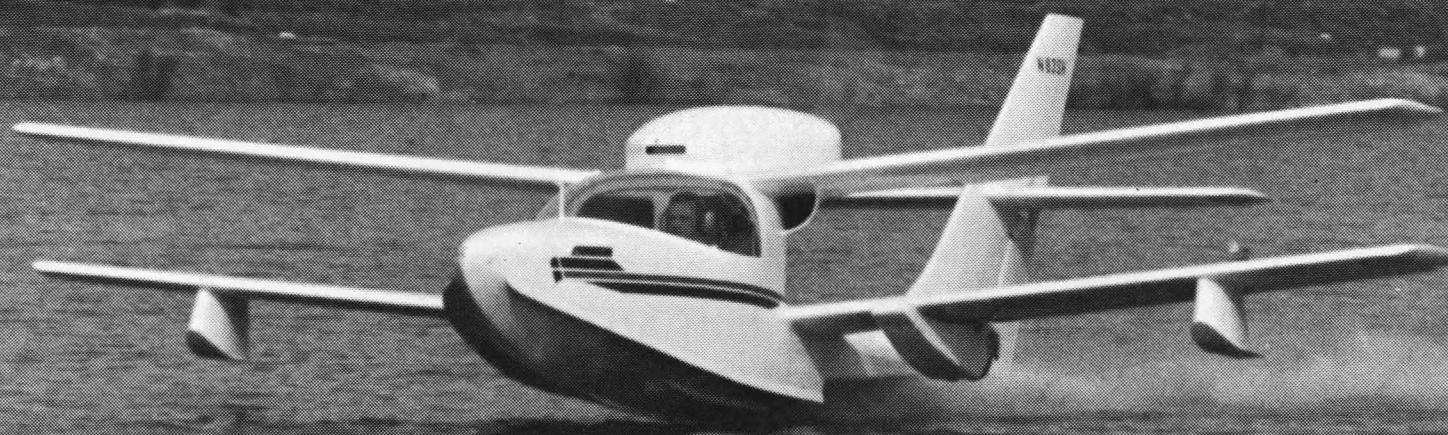
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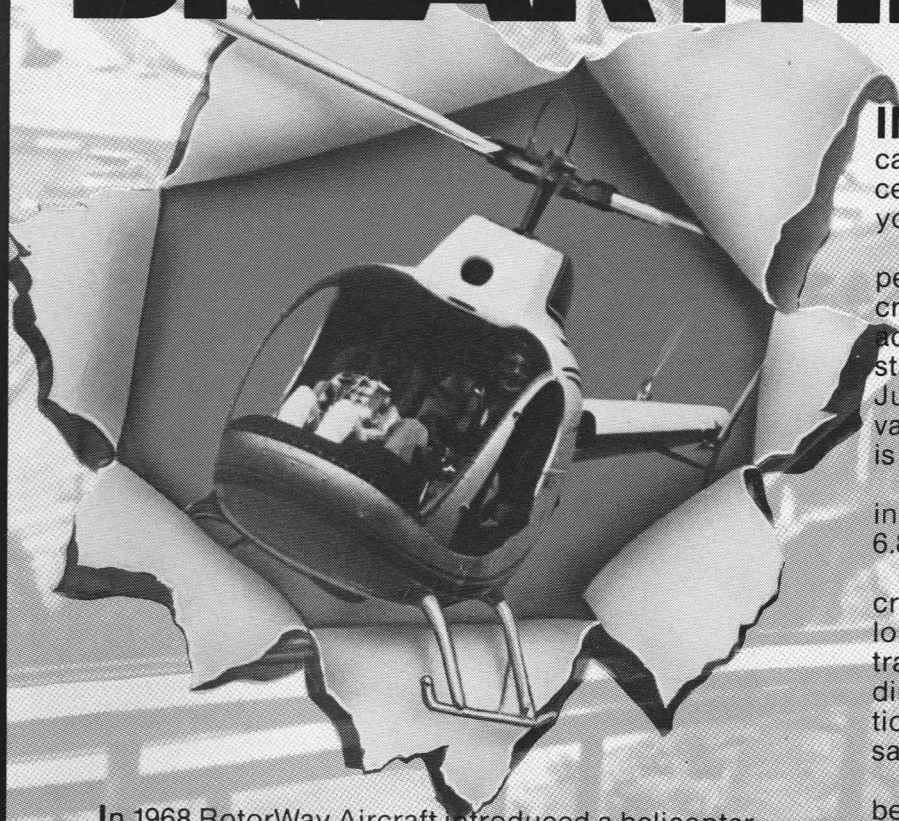
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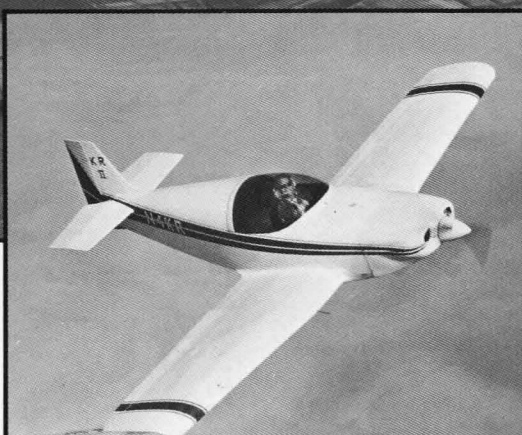
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